IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 3.] July, 1933. [No. 7.

DISEASES CAUSED BY BACTERIA AND FUNGI.

EDWARDS, S. J. (1932). **The Diagnosis of Chronic Streptococcus Mastitis in Cattle.**—*Vet. Rec.* **12.** 977-979. [Paper presented to the Western Counties Division of the N.V.M.A.]

The subject is introduced by a short description of the symptoms and course of this form of mastitis, emphasis being laid on its wide distribution and on the insidious nature of its development. In view of the failure of vaccination and of chemotherapeutic measures, the only method of control available is that which aims at the detection of latent cases and the prevention of dissemination by having these milked last.

Useful information for this purpose may often be gained in the cowshed from the history of the animal, palpation, inspection of the milk against a black background and from its reaction. Further help may be obtained from the amount and character of the sediment deposited by centrifuging. It is emphasized, however, that in the early stages of the disease a cultural method is likely to be the only means of demonstrating infection, and that, although laboratory facilities are essential, the task need not be unduly laborious or costly.

A discussion followed.—A. W. STABLEFORTH.

STEENBLOCK, J. (1932). Der Streptococcus epidemicus Davis als Mastitiserreger in der Rheinprovinz. [*Streptococcus epidemicus*, **Davis as the Cause of Mastitis in the Rhineland**].—*Tierärztl. Rdsch.* **38.** 561-564. [6 refs.]

The author reports the isolation of *Str. epidemicus* from the udders of three cows in two herds.

The first two cases occurred in a herd of 20 cows and were characterized by an acute mastitis associated with marked constitutional disturbance, which contrasted strongly with the ordinary chronic form of mastitis which was well known on the farm. One cow was clinically affected in two quarters, the other in one quarter. From these quarters and also from quarters whose secretion appeared normal, streptococci were isolated which in respect of haemolysis and pathogenicity, final pH in sugar media and of their characters in broth, methylene blue milk and litmus milk had the characters of *Str. epidemicus*. No capsule was, however, demonstrable. The affected milk caused no disturbance when fed to calves and young pigs or to mice. In the third case a strain with similar characters was obtained from a normal sample from a cow that had shown slight disturbance at an earlier date.

The author stresses the fact that cultural methods are essential in order to detect such possible causes of danger to man, and that, because the colonies of *Str. epidemicus* cannot be distinguished from those of *Str. agalactiae* on ordinary agar, further identification of colonies is necessary in other media including blood agar plates. He also suggests that in order that cases may not be missed samples of milk should be accompanied by details of the clinical symptoms shown by the animal.—A. W. STABLEFORTH.

I. FLECK, L., & ELSTER, Olga. (1932). Zur Variabilität der Streptokokken. [**On the Variability of Streptococci**].—*Zlb. Bakt. I.* (*Orig.*). **125.** 180-200. 34 figs. on 2 plates, 2 tables. [33 refs.]

II. EVANS, Alice C. (1932). **The Metamorphosis of Streptococci into Spore-Bearing Rods and into Filterable Forms.**—*Publ. Health Rep. Washington.* **47.** 1723-1738. 20 figs. on 4 plates. [16 refs.]

I. A detailed report is given on a pigment-forming streptococcus isolated from a case of cystopyelitis, which resembled *Streptococcus pyogenes*, Rosenbach. The strain showed pronounced variability in respect of morphology, colony form and pigment production. The number of forms is given as about 200, and they are classified as fixed variations, discontinuous variations, and cyclic variations.

In three other unselected strains of streptococcus analogous behaviour was noted.

II. It is concluded that a streptococcus, a filtrable form, and an aerobic, Gram-positive, spore-bearing rod are phases in the life cycle of an organism cultivated from cases of epidemic encephalitis and from the so-called herpetic and encephalitic viruses. Both the streptococcus and the rod forms were obtained from all of the six herpes and encephalitic viruses which were studied. In 20 cases of epidemic encephalitis studied, the rod form was obtained 11 times and the streptococcus 5 times. Details of the transitions, which were reversible, are described in a few instances.—A. W. STABLEFORTH.

IDZERDA, J., & VAN EVERDINGEN, W. A. G. (1932). Zur Kenntnis der Aenderungen, die in Blutnährböden durch Streptokokkus Typus α (Brown) verursacht werden. III. Ueber die Wirkung von sterilen Bouillonfiltration und von geringen H_2O_2—Konzentrationen auf kleine Erythrozytenmengen. [**On the Alterations, which are caused in Blood Media by Streptococci of α Type (Brown). III. On the Action of Sterile Broth Filtrates and Small Concentrations of H_2O_2 on Small Amounts of Erythrocytes**].—*Zlb. Bakt. I.* (*Orig.*). **124.** 185-196. 11 tables. [5 refs.]

The authors conclude from this and their previous studies [see this *Bulletin.* **2.** 11 and 287.] that from the colonies in a blood agar plate (Brown) and from developing streptococci in broth some agent is excreted which has the same influence on red blood cells as is shown by hydrogen peroxide in the same medium. The agent is not formed in chemically detectable amounts in ordinary test tubes, and the physical and chemical changes described either do not occur or occur only partly in ordinary blood broth tubes or in Asheshow's twin tubes. They occur if the production of the agent is increased by cultivation in thin layers and if catalase action is decreased by the use of small amounts of erythrocytes ; as a result strong benzidine reactions may also be produced.—A. W. STABLEFORTH.

WARD, H. K. (1932). **An Examination of the Mechanism of Pneumococcus Immunity by means of Bactericidal Measurements. I. The Reaction between the Anticarbohydrate Antibody and the Purified Specific Carbo-**

hydrate. II. The Reaction between the Anticarbohydrate Antibody and Type-Specific Products of the Organism.—*J. Exp. Med.* **55.** 511-518 and 519-530. 8 tables. [13 refs.]

A Type III antipneumococcus serum which has been absorbed with specific carbohydrate until it no longer gives a precipitate with carbohydrate still has a definite, though diminished, bactericidal action and still retains some of its power to neutralize the antibactericidal effect of specific carbohydrate (modified Todd technique used for bactericidal measurements). The carbohydrate neutralization test is therefore a much more delicate test and there is no need to predicate another antibody to explain the bactericidal action of a carbohydrate-absorbed serum or a similar result in a mouse protection test. The specific carbohydrate has a definite antibactericidal action, but were it present in this form in pneumonia, it could not conceivably be produced in sufficient amount to influence the results. [For methods see (1930). *J. Exp. Med.* **51.** 675].

In the work described in the second contribution the author has demonstrated by the technique previously described that in the filtrate of a 5-day broth culture of Type III pneumococcus there is a type-specific substance which has a far more powerful antibactericidal action than the purified carbohydrate ; if precipitinogen content is taken as a basis for comparison, its action is about one thousand times that of the carbohydrate. A similar substance, but in stronger concentration, was found in the filtrate from the lung of a patient who had died of Type III pneumonia. The substance appears to be related to the specific carbohydrate and its nature and possible influence on the disease are discussed.

One specimen of Type III convalescent blood, though comparatively weak in precipitin, was better able to neutralize the broth or lung filtrate than a corresponding mixture of normal blood and antiserum. Two other specimens of Type III convalescent blood gave efficient neutralization.—A. W. Stableforth.

Jones, F. S., Little, R. B., & Orcutt, Marion. (1932). **A Continuation of the Study of the Etiology of Infectious Diarrhea (Winter Scours) in Cattle.**—*J. Amer. Vet. Med. Ass.* **81.** 610-619. 8 figs., 2 tables. [1 ref.] [Paper presented at the 69th Annual Meeting of the A.V.M.A.

In a previous paper the two senior authors described five outbreaks of a communicable disease of cattle which occurred in the winter of 1928 to 1929, in which diarrhoea was the principal symptom. The condition is known in America as winter dysentery. The present paper is a continuation of the investigation, during which three more outbreaks were studied.

The disease occurs following the introduction of cows which have become recently infected. The symptoms in the present outbreaks were identical with those of the previous year in that the faeces were liquid and copious and contained in many cases considerable quantities of blood, mucus and bloodstained mucus. There was marked suppressions of milk secretion. Cultures of the vibrios associated with this disease were difficult to obtain from the naturally infected cows, but were more readily obtainable from the intestinal wall of calves experimentally infected by feeding faeces from the spontaneous cases. Pure cultures of the vibrio reproduced the disease. The culture medium used was blood-agar in sealed tubes, growth being first obtained in the condensation fluid.

In experimental calves the clinical manifestations were slight, mucus appearing usually in the form of casts containing vibrios in large numbers. A slight rise of temperature occurred and the faeces became softer and darker in colour.

—S. H. Gaiger.

SEIJFFERS, S. M. (1932). Eenige Mededeelingen omtrent de Miltvuur—Bestrijding in den Ambtskring Watampone. [**The Control of Anthrax in the Watampone District**].—*Ned.-Indisch. Blad. Diergeneesk.* **44.** 216-218. [Summary in German : abst. from orig.]

The author gives an account of the mass vaccination of buffaloes against anthrax in this district in the South Celebes during 1931. 62,000 animals were treated with vaccine alone and some 4,000 by simultaneous inoculation. Less than 80 animals died of anthrax. During the same period 56 animals were given anti-anthrax serum as a curative measure and of these 33 survived. During the same period 278 horses were treated with vaccine alone and 28 by simultaneous inoculation. Of the former, 22 developed anthrax within 18 days and four of these were treated with serum. Two survived.

The number of cattle vaccinated during the period was 135, while 88 were subjected to simultaneous inoculation.

As at the time the inoculations were carried out, outbreaks of anthrax were occurring in other districts, the results are very satisfactory.

—A. LESLIE SHEATHER.

STAUB, A. (1932). Sur la vaccination anticharbonneuse. [**Anti-Anthrax Vaccination**].—*C. R. Soc. Biol. Paris.* **110.** 1214-1215.

A comparison of the immunity produced by (a) the subcutaneous inoculation of virulent anthrax bacilli suspended in 10 per cent. saponin and (b) the intradermal vaccination of attenuated cultures.

Whilst rabbits inoculated subcutaneously with virulent anthrax cultures suspended in saponin escaped infection, the inoculation was only followed by immunity in one case out of 14, whereas intradermal vaccination led to a solid immunity in 11 cases out of 14.—GWILYM O. DAVIES.

BERGER, H. C. L. E. (1932). Les méthodes de prophylaxie de la tuberculose bovine et leurs résultats. [**The Control of Bovine Tuberculosis and the Results achieved**].—*Bull. off. internat. Epiz.* **6.** 1-40.

The author discusses the various difficulties encountered in the eradication of bovine tuberculosis. He reiterates the well-known arguments for and against State intervention in combating the disease. He favours voluntary effort on the part of owners and recommends, after considering various alternative methods, that all animals which react to the tuberculin test should be branded, as this does not interfere with normal commercial movements of animals, but reduces, and rightly so, the value of affected animals and safeguards the interests of potential purchasers. This system is practised in the Netherlands and the branding of reactors is a *sine qua non* for obtaining financial assistance from the State in the voluntary eradication of the disease.

Berger gives details of the policies followed in controlling tuberculosis in the various countries of the old and new world. It is too early yet to assess the results achieved, but, in as far as the work has progressed, the efforts made appear to be half-hearted and feeble and are meeting with the results which might in the circumstances be reasonably anticipated.

He recommends the voluntary use under Government supervision of BCG vaccine in heavily infected herds.—T. M. DOYLE.

NORTON, J. F., THOMAS, J. G., & BROOM, Norma H. (1932). **Laboratory Tests for Tubercle Bacilli by Culture Methods.**—*Amer. Rev. Tuberc.* **25.** 378-382. 4 tables. [1 ref.]

Growths of tubercle bacilli were obtained from 137 out of 394 specimens, chiefly pleural fluid, urine or spinal fluid, in which tubercle bacilli could not be found by microscopic examination, in an average of 30 days, with a minimum of 12 and a maximum of 77 days. In 151 cases guinea pig tests (2 animals) were run in parallel : 35 specimens gave positive results by both methods, 3 by guinea pig only and 16 by culture only.

There was some evidence that Petragnani's medium was slightly superior to Petroff's medium modified by the substitution of malachite green for gentian violet. It is emphasized that more than one heating at 80°C. reduced the value of the media, details of whose preparation are given. Contaminated specimens were treated with 3 per cent. hydrochloric acid for 15 minutes and centrifuged for a similar period.—A. W. STABLEFORTH.

I. JENSEN, K. A. (1932). Reinzüchtung und Typenbestimmung von Tuberkelbazillenstämmen. Eine Vereinfachung der Methoden für die Praxis. [**Pure Culture and Typing of Tubercle Strains. A Simplification of Routine Methods**].—*Zlb. Bakt. I.* (*Orig.*). **125.** 222-239. 3 tables. [18 refs.]

II. SPANIER, P., & TSCHERTKOWA, Emilie. (1932). Ein neues Verfahren zur Tuberkelbazillenzüchtung auf flüssigen Nährböden. [**A New Method for the Cultivation of Tubercle Bacilli on Liquid Media**].—*Ibid.* 361-364. [6 refs.]

I. The author describes the technique by which about 3,000 specimens have been examined during each of the two last years in the tuberculosis department of the State Serum Institute in Copenhagen. He believes that it brings the pure culture and typing of tubercle bacilli into the realm of every day work in a well-equipped laboratory, and that in accuracy it is not inferior to the methods in general use.

Portions of about 0·5 to 1 c.c. of the suspect material are treated with (a) 10 c.c. of 4 per cent. caustic soda and (b) from 4 to 5 c.c. of 6 per cent. sulphuric acid in 15 c.c. tubes. The tube containing alkali is placed at 37°C. for from 20 to 30 minutes, and centrifuged for 20 minutes at 3,000 R.P.M. Part of the deposit is used to sow two tubes of Besredka's alkaline egg medium (one with malachite green, one without). After neutralization, the remainder is sown on two or three tubes of Löwenstein's potato-egg-asparagine medium from which the condensation water has been removed. The tube containing acid is left at room temperature for ten minutes, then filled with saline and centrifuged for ten minutes. The deposit is sown on tubes of Löwenstein's medium from which the condensation water has not been removed. Urine, spinal fluid, etc. are treated specially. The use of tubes of Löwenstein's medium made with and without glycerol is recommended. Growth appears usually within 8 to 24 days in the case of human strains, but in the case of bovines may sometimes not appear for two months. A satisfactory conclusion regarding type can only be made on tubes sown with material homogenized with alkali. If growth occurs only on media sown with acid treated material or in Besredka's medium, some of the growth is treated with alkali and subcultures made. All dysgonic strains are subcultured in Besredka's medium and tested by subcutaneous inoculation of a 2 kg. rabbit with 10 mg. of culture. Details are given of the preparation of media.

Tables are given comparing the results of cultural methods and animal inoculation in 111 cases (61 human, 49 bovine, and one mixed infection). In all cases, except the one case of mixed infection, there was agreement between the type as determined by culture on Löwenstein's medium, and that as determined by pathogenicity for rabbits or by culture on glycerol potato or broth. Further, in 58 out of 59 cases in which the original material produced tuberculosis in a

guinea pig, and in one case in which it failed, growth was obtained directly on Löwenstein's or in Besredka's medium, generally with both. It is suggested that the pathogenicity test might even be dispensed with, because using Löwenstein's medium no dysgonic human strains have been encountered. No " attenuated " bovine strains were obtained, all dysgonic strains producing death or advanced tuberculosis within three months.

The latter part of the article gives figures relating to the frequency of human and bovine strains in cases of tuberculosis of the various organs of human beings in Denmark. Cervical tuberculosis was in the majority of cases caused by bovine strains ; in children under 15 years in four-fifths of the cases. Tuberculosis of the kidneys was in one-fifth of cases bovine. Tuberculous meningitis was in a quarter of cases bovine in origin : in children under 5 years it was bovine in one half of the cases. Nearly all other forms of surgical tuberculosis and cases of phthisis were caused by bacilli of human type.

II. In a long series of tests it was found that the seeding of liquid media with acid-fast organisms of all types was greatly facilitated by mixing the seed, whether from infected tissue from a solid medium or from another liquid medium, with a small quantity of sterile liquid paraffin.—A. W. STABLEFORTH.

I. VORWALD, A. J. (1932). **The Early Cellular Reactions in the Lungs of Rabbits Injected Intravenously with Human Tubercle Bacilli.**—*Amer. Rev. Tuberc.* **25.** 74-88. 6 plates. [14 refs.]

II. DOLDER, W. (1932). Un cas de T-B-C spontanée chez le lapin. [**A Case of Spontaneous Tuberculosis in the Rabbit**].—*Schweiz. Arch. Tierhlk.* **74.** 27-31. [5 refs.]

I. The purpose of the paper is stated to be to direct attention to the cellular response occurring in the lungs of normal rabbits at intervals of from one hour to one month after inoculation, stressing particularly the cellular changes occurring within the first day.

At the earliest periods it was noted that the first cells to respond to the intravenous injection of 0·1 mg. per kg. animal weight were the polymorphonuclear leucocytes, which were massed and phagocytosing the micro-organisms. It is through the agency of the polymorphonuclear leucocytes that the site of subsequent development of the tubercle is determined. These cells phagocytose the tubercle bacilli in the blood stream and stagnate in small accumulations in the capillaries where the current is slow. The accumulations of polymorphonuclear leucocytes form the ground work from which the epithelioid tubercles develop.

From 14 to 18 hours onwards after inoculation the mononuclear exudate cells are preponderant in the cellular response. They phagocytose the polymorphonuclear leucocytes and take up their content of bacilli. In this way Vorwald claims that the mononuclear cell tubercle replaces the leucocytic mass and ultimately the epithelioid tubercle develops. Throughout all periods, the absence of mitotic figures in the cellular reactions was a striking feature.

II. The author describes the finding of this rabbit which was offered for sale in the market at Lausanne in 1931. Examination showed enormous lesions in the lungs, many of which were caseous, and also lesions in the bronchial and mediastinal glands. The costal pleura, the heart, the diaphragm, the kidneys, the suprarenal glands, the ovaries, and the sublumbar and inguinal glands were affected. The liver did not show macroscopic lesions. The spleen and the intestines were not available for examination. Subsequent examination of the organism showed it to be of the bovine type. It was not possible to say how the rabbit became infected because no history could be obtained.—NORMAN DOBSON.

I. CERNAIANU, C., POPOVICI, I., & JITARCIUC, N. (1932). Spontane geflügeltuberkulose beim Kaninchen. [**Spontaneous Avian Tuberculosis in Rabbits**].—*Deuts. tierärztl. Wschr.* **40.** 767-768. [8 refs.]

II. CERNAIANU, C., POPOVICI, I., & JITARCIUC, N. (1932). Sur un cas de tuberculose spontanée, chez le lapin, causée par le Bacille du type aviaire. [**A Spontaneous Case of Tuberculosis in a Rabbit caused by the Avian Tubercle Bacillus**].—*C. R. Soc. Biol. Paris.* **111.** 125-127. [6 refs.]

I. The authors refer to the literature on the subject. They then describe cases in rabbits drawn from normal stock amongst which fowls were kept. Losses through tuberculosis occurred amongst the fowls and subsequently when rabbits were killed in an experiment they were found to have generalized lesions of tuberculosis. Animal inoculation experiments indicated that the infection was an avian type of tubercle bacillus.

II. This article deals with the above outbreak.—E. J. PULLINGER.

I. SCHAAF, J. (1932). Untersuchungen über die Tuberkulose der Enten. [**Investigations of Tuberculosis of Ducks**].—*Berl. tierärztl. Wschr.* **48.** 350-352. [18 refs.]

II. BERGE, R. (1932). Tuberkulose bei einer Ente. [**Tuberculosis in a Duck**]. —*Deuts. tierärztl. Wschr.* **40.** 101-102. 1 fig.

I. As the result of studying two mixed flocks of fowls and ducks, the author concludes that tuberculosis shows only a slight tendency to spread amongst the latter.

Eight cases in ducks were studied. The symptoms were emaciation, blood changes, inappetence and a slight persistent diarrhoea. Lameness was not common [see II]. Blood changes comprised anaemia with polychromasia and anisocytosis, whilst there was an increase of monocytes and pseudoeosinophile cells. *Post-mortem* lesions resembled those occurring in the fowl, but there was a greater tendency towards marked lesions occurring in the lungs and serous membranes.

Culturally and by animal inoculation experiments, the organism concerned appeared identical with the avian type of tubercle bacillus. An experiment is described showing the natural spread of infection from duck to fowl.

II. Symptoms and *post-mortem* lesions of a case of tuberculosis in a duck are described. Lameness was an outstanding symptom. Pathological changes were confined mainly to caseating foci in the liver and spleen. By animal inoculation, a diagnosis of tuberculosis of avian type was made.—E. J. PULLINGER.

ARLOING, F., THÉVENOT, L., & ROQUES, A. (1932). Le rein dans la tuberculose expérimentale du Cobaye. [**The Kidney in Experimental Tuberculosis of the Guinea Pig**].—*C. R. Soc. Biol. Paris.* **111.** 806-807.

ARLOING, F., THÉVENOT, L., & ROQUES, A. (1932). Résistance du parenchyme rénal chez le Cobaye vis-à-vis de l'infection tuberculeuse. [**Resistance of the Kidney Parenchyma of the Guinea Pig towards Tuberculosis Infection**]. —*Ibid.* 807-808.

Tuberculosis of the kidney in the guinea pig is very rare. Microscopic and reinoculation experiments have confirmed the negative macroscopic findings. Even direct inoculation into the kidney parenchyma failed to set up kidney lesions, although rabbits, goats and dogs readily succumbed to this method. The kidney of the guinea pig therefore appears to have a peculiar resistance to tuberculosis. —NORMAN HOLE.

SUSTMANN. (1932). Tuberkulose bei Seelöwen. [**Tuberculosis in Sea Lions**].— *Deuts. tieräztl. Wschr.* **40.** 769.

The author describes cases of tuberculosis in two sea lions, which before death reacted to the ophthalmic tuberculin test. Both animals died and on autopsy severe tuberculous pleuro-pneumonia and intestinal tuberculosis were found.

—J. E.

I. EBER, A. (1932). Ueber das Vorkommen virulenter Tuberkelbazillen in Handelseiern. [**On the Occurrence of Virulent Tubercle Bacilli in Market Eggs**].—*Zschr. Fleisch- u. Milchhyg.* **42.** 297-300. [3 refs.]

II. LICHTENSTEIN, S. (1932). Ueber das Vorkommen von Tuberkelbazillen in Hühnereiern. [**On the Occurrence of Tubercle Bacilli in Hens' Eggs**].—*Zschr. Tuberk.* **64.** 245-251. 2 tables. [18 refs.]

I. Eber takes exception to KLIMMER's statement that 3 per cent. of market eggs and 10 per cent. of the eggs laid by tuberculous fowls contain tubercle bacilli, and concludes from his own examination of 525 market eggs and 216 eggs from diseased flocks or from artificially infected birds that the percentage of eggs containing virulent tubercle bacilli is nearer 0·38 per cent. and 0·46 per cent. respectively. By virulent bacilli are meant those which could be cultivated on Petragnani's medium (using a modified antiformin method) and which were virulent for fowls. He notes, however, that in 1·71 per cent. of the market eggs and in 9·27 per cent. of the eggs from infected birds, though cultures were negative, acid-fast bacilli could be detected microscopically. These he considers as dead. In this connection he also records observations on 38 fresh eggs artificially infected with about two million avian tubercle bacilli. The bacilli were detected by culture up to 167 days, but were recognized microscopically up to the last examination which was at 198 days.

II. A further report of the same investigation by another worker, whose conclusions are similar.—A. W. STABLEFORTH.

DIECKMANN, H., & MENZEL, Gertrud. (1932). Der Gasstoffwechsel der Tuberkelbacillen. I. Die Technik der Bestimmung des O_2 Verbrauches von Tuberkelbacillen. [**The Respiration of Tubercle Bacilli. I. The Technique of the Estimation of Oxygen Consumption by Tubercle Bacilli**].—*Zschr. Hyg. u. Infektkr.* **113.** 709-734. 3 figs. 12 tables. [15 refs.]

The authors have used the Warburg method, with a modified shaking device, for estimating the oxygen consumption of tubercle bacilli. A strain of human tubercle bacilli examined utilized 20 c.mm. of oxygen per mg. of dry weight of organism per hour. Organisms obtained from cultures grown for from 10 to 20 days appear to utilize the greatest amount of oxygen. If the suspension contains ammonium acetate-phosphate buffer the oxygen consumption is three or four times greater than it is if the bacteria are suspended in saline, in Ringer's solution or in phosphate buffer solution without the ammonium acetate. Pulverization of the organism by trituration in an agate mortar leads to a considerable diminution of the oxygen consumption.—W. R. WOOLDRIDGE.

NÈGRE, L., & VALTIS, J. (1932). Sur l'affaiblissement de la virulence de bacille tuberculeux par réensemencements précoces. [**Attenuation of Tubercle Bacilli by subculturing at Short Intervals**].—*Ann. Inst. Pasteur.* **48.** 710-724. [1 ref.]

Nègre and Valtis, in collaboration with BOQUET [(1930). *Ann. Inst. Pasteur.* **44.** 247.] have previously reported that three to four-day-old surface growths of tubercle bacilli grown on Sauton's medium are less virulent than older cultures. In view of this finding Nègre and Valtis have studied the effect of subculturing every three

or four days two strains of tubercle bacilli of known virulence, one bovine and one human, on Sauton's medium. These strains were transferred after six months to glycerol potato and their virulence tested on rabbits and guinea pigs. It was found that, although both strains had undergone some attenuation, there was a marked difference in the degree of attenuation. As subcultures of the attenuated strains were not kept the work was resumed with two bovine strains.

Bovine strain M recently isolated was considerably attenuated by repeated subculturing every three to four days. Bovine strain Vallée was also found to be attenuated at the end of six months and a second test after 12 months showed further attenuation. This strain, after 52 passages, was subcultured every month on glycerol potato for two and a half years without causing any appreciable variation in its virulence.

The results obtained by this method of attenuation were in general very irregular, as two similar experiments with the same strain would frequently give contradictory results.—T. M. Doyle.

Willis, H. S. (1932). **The Effect of Mechanical Grinding on Tubercle Bacilli.**—*Amer. Rev. Tuberc.* **25.** 224-230. [1 ref.]

Dried tubercle bacilli that have been ground in a ball mill for two days contain forms that are tuberculogenic and pathogenic for guinea pigs. Those that have been ground for longer than two days are occasionally tuberculogenic, but are not pathogenic for guinea pigs.—Norman Dobson.

I. Nélis, P., & Picard, E. (1932). Contribution à l'étude de l'innocuité du BCG chez le Cobaye soumis aux irradiations Röntgen. [**Innocuity of BCG for Guinea Pigs submitted to Röntgen Rays**].—*C. R. Soc. Biol. Paris.* **110.** 31-32.

II. Beerens, J. (1932). Innocuité des injections sous-cutanées répétées de BCG pour le Cobaye. [**Innocuity of Repeated Subcutaneous Injections of BCG for the Guinea Pig**].—*Ibid.* 898-899.

I. Nélis and Picard tested the effect of repeated application of X-rays on (1) guinea pigs inoculated subcutaneously with 0·001 g. of virulent tubercle bacilli ; (2) guinea pigs inoculated subcutaneously with 0·01 g. BCG and (3) guinea pigs inoculated subcutaneously with 0·001 g. of BCG. The site of inoculation was irradiated with 1,500 R. on four occasions at intervals of eight days.

They found that repeated irradiation had no effect on the evolution of tuberculosis in guinea pigs and that it was incapable of modifying the virulence of BCG.

II. Beerens inoculated guinea pigs with repeated large doses and small doses of BCG, to determine whether the original virulence could be restored by this means. Group I—six guinea pigs were given subcutaneously 8 injections each of 1 mg. BCG at five-day intervals. Group II—six guinea pigs were given subcutaneously 30 injections each of 0·01 mg. BCG every two days. Group III—twelve guinea pigs were given subcutaneously 35 injections each of 0·01 mg. BCG at the rate of three injections weekly.

It was shown that repeated subcutaneous injections of BCG in either large or small doses were harmless for guinea pigs.—T. M. Doyle.

Cassamagnaghi, A. (1932). Observations sur la morphologie et le pouvoir de filtration du Preisz-Nocard ; son terrain préféré, la peau, à travers laquelle a lieu l'infection. [**Observations on the Morphology and the Filtrability of the Preisz-Nocard Bacillus and the Preference for Infection by Way of the Skin**].—*An. Escuela vet. Montevideo, Uruguay.* **2.** 3-11. [Orig. in French.]

The pleomorphic appearance of the Preisz-Nocard bacillus in culture media is compared with the uniform appearance of the organism in the glands of infected sheep. The presence of numbers of small granules within the body of the bacillus suggested the possibility of obtaining filtrable forms which would be capable of producing infection in guinea pigs.

An emulsion of an infected gland was filtered through Chamberland L_1 and L_2 candles. The filtrates were injected subcutaneously into guinea pigs.

The lesions produced were similar to those found after injection of unfiltered emulsions and the Preisz-Nocard bacillus was recovered in cultures from the glands. From the results obtained in these experiments the existence of a filtrable form of the Preisz-Nocard bacillus has been suggested.

The author also claims to have set up infection in guinea pigs and sheep by placing suspensions of the Preisz-Nocard bacillus on the intact skin. He concludes from these experiments that infection under natural conditions can take place in this way.—A. J. WILSDON.

KASAI, K., OGURA, K., & KOHANAWA, C. (1932). **Comparative Studies of** *B. abortivo-equinus* **and** *B. paratyphosus* **B. I. Bacteriostasis.**—*J. Jap. Soc. Vet. Sci.* **11.** 73-80. 4 tables. [17 refs.] [Orig. in Japanese : abst. from English summary].

Acid fuchsin, trypan blue, trypan red and alizarin do not appear to inhibit the growth of *Bact. paratyphosum* B nor of *Bact. abortus equi* even in dilutions of 1 : 200. *Bact. abortus equi* is stated to be more sensitive to malachite green, brilliant green, crystal violet, methyl violet B, gentian violet, methylene blue and trypaflavine than *Bact. paratyphosum* B. As certain strains examined appeared to vary and as *Bact. abortus equi* may become more tolerant to such dyes by subculture in the dye media, the authors doubt any significant difference in sensitivity.

—R. LOVELL.

MCCLUNG, L. S., & WINTERS, J. C. (1932). **Effect of Vitamin A-Free Diet on Resistance to Infection by Salmonella enteritidis.**—*J. Infect. Dis.* **51.** 469-474. 1 table, 2 charts. [9 refs.]

MCCLUNG, L. S., & WINTERS, J. C. (1932). **Effect of Dietary Deficiency of Vitamin D in Relation to Infection by Salmonella enteritidis.**—*Ibid.* 475-481. 2 tables, 2 charts. [13 refs.]

These papers refer to two experiments in which male rats were used. Forty-four rats from twelve litters were employed in each, half of them being controls.

The following diet was used for the group of vitamin A free rats :—

Vitamin A free casein	18 per cent.
Irradiated yeast	10 per cent.
Sodium chloride	1 per cent.
Osborne and Mendel salt mixture ...	4 per cent.
Corn starch	67 per cent.

The diet for the control group was similar to the above except that unpurified casein was used and five drops of cod liver oil were given to each animal daily.

The following diet was used for the vitamin D free group :—

Casein, free from fat soluble vitamins	18 per cent.
Osborne and Mendel salt mixture ...	4 per cent.
Dried brewers' yeast (non-irradiated)	10 per cent.
Sodium chloride	1 per cent.
Powdered dry spinach	1 per cent.
Corn starch	66 per cent.

Their control group was fed similarly to the control group in the vitamin A deficiency experiment except that non-irradiated yeast was used instead of irradiated.

The vitamin A deficient group of rats ate more than their controls (possibly due to an overdose of vitamin D in the diet of the controls), but there was no variation between the weight of the two groups until the seventh week when the vitamin A deficient rats began to lose weight. In the case of the rats used in the vitamin D experiment, no difference was observed in either appetite or gains between the experimental animals and their controls.

After seven weeks all the rats in both experiments received 1 c.c. of a 24-hour broth culture of *Bacterium enteritidis* intraperitoneally.

The results obtained indicate that a slight increase of susceptibility to infection occurs in rats fed on a diet deficient in vitamin D and that the resistance of rats fed on a vitamin A deficient diet is markedly reduced.—EDWARD F. PECK.

SAXER, E. (1932). Gärtnerinfektion bei Truthühnern. [*Bacterium enteritidis*—**(Gärtner) Infection of Turkeys**].—*Schweiz. Arch. Tierhlk.* **74.** 351-356. 2 tables. [1 ref.]

An outbreak of disease in turkeys is recorded. After a short illness consisting of lassitude and diarrhoea, affected birds died. The pathological findings in four birds are recorded ; they consisted chiefly of a haemorrhagic enteritis. Cultures from the heart blood revealed the presence of Gram-negative bacilli which biochemically and by direct agglutination appeared to be anaerogenic strains of *Bact. enteritidis*, although the recorded studies are insufficient to determine the exact nature of the organisms. The isolated bacteria were pathogenic for mice by subcutaneous inoculation and attention is drawn to the association of food poisoning in man and *Bact. enteritidis* and the possible dangers arising from the consumption of flesh of emergency-slaughtered animals, which may be infected with such an organism.—R. LOVELL.

LESBOUYRIES, & VERGE. (1932). Paratyphose du Pigeon. [**Paratyphoid in Pigeons**].—*Bull. Acad. vét. France.* **5.** 294-301. 1 fig., 1 table. [3 refs.]

Paratyphoid of pigeons may present two clinical forms, the acute in which the pigeon succumbs rapidly with lesions of ulcerative enteritis and hepatitis, and the chronic which is manifested chiefly by an arthritis either of the leg or wing joints. This latter disability is of interest in carrier pigeons.

Cultures have been made from the blood, liver, bone marrow and synovia of birds which were either ill or dead. The cultural and biochemical reactions are recorded. Of seven strains examined, all were agglutinated by a serum prepared against *Bact. aertrycke*, but cross-agglutination by sera prepared against *Bact. abortus equi* in two cases and *Bact. paratyphosum* B in one case also occurred. The authors classify the latter three strains as intermediate or allied to *Bact. aertrycke*. [*Bact. aertrycke*, *Bact. paratyphosum* B and *Bact. abortus equi* have antigens in common which would account for this cross-agglutination].

Prophylaxis consists of elimination of reactors by the agglutination test and it is noted that infection may be transmitted through the egg. Preventive vaccination with a killed suspension of a 48-hour culture of the causal organisms has had varying results.

Attention is drawn to the pathogenicity of this group of organisms for human beings.—R. LOVELL.

I. KINSLEY, A. T. (1932). **Bang's Disease.**—*Vet. Med.* **27.** 100-102.

II. —. (1932). La prophylaxie de l'avortement épizootique. [**The Control of Bovine Contagious Abortion**].—*Rev. gén. Méd. vét.* **41.** 611-614.

I. Kinsley gives a general survey of some of the principal facts in connection with abortion. He estimates that 18 per cent. of breeding cattle and 50 per cent. of herds in the U.S.A. are infected with the disease.

II. This is a review of the recommendations drawn up by the Abortion Commission of the Swiss Veterinary Association at the request of the Federal Veterinary Office. It describes the various precautions which should be practised for the control of the disease.

[The Commission recommends the use of live vaccine on animals which have aborted. The object of this procedure seems somewhat obscure].—T. M. Doyle.

I. Rolle, M. (1932). Zusammenhang zwischen der Anwesenheit des Bacterium abortus [Bang] im Organismus und der Agglutination. [**The Connection between the Presence of** *Br. abortus* **and of Specific Agglutinins in the Host**].—*Deuts. tierärztl. Wschr.* **40.** 748-750. 2 tables. [4 refs.]

II. Meyer, F. (1932). Sind durch Agglutination und Meinicke-Klärungs-Reaktion des Blutes und der Milch in Abortusbeständen die euterinfizierten Tiere zu ermitteln ? [**Can the Agglutination and Meinicke Reactions of Blood and Milk reveal the Presence of Udder-Infected Animals ?**]—*Inaug. Diss. Hanover.* pp. 45. 14 tables. [48 refs.]

I. The inoculation of dead cultures of *Br. abortus* into guinea pigs causes a rise of specific agglutinin titre in two to three weeks which disappears within three to four months.

When living cultures were inoculated into guinea pigs, in two cases in which a serum titre of 1 : 4,000 was registered a few months after infection, the author was unable to demonstrate the presence of organisms by the subinoculation of tissue juice into guinea pigs.

Living organisms were demonstrated in the cervical lymph glands of two bovines after the agglutinin titre had risen to about 1 : 40 after inoculation with living culture. In another case, with a titre of 1 : 50, no living organisms were demonstrated.

II. Working with a group of 176 cows, the author found that 129 showed a serum titre of 1 : 100 or over and that of these 103 gave a milk titre of 1 : 20 or over. It was not found possible to correlate a high titre of either the serum or milk with the excretion of viable organisms. Similarly, a positive Meinicke reaction [M.K.R.] of the serum was no evidence of the excretion of organisms. The M.K.R. was of no value in testing milk.

Guinea pig inoculation of 1·5 c.c. of cream and sediment from 35 c.c. of milk was used to test for the excretion of organisms. An agglutinin titre of 1 : 50 in the guinea pig was considered positive. All guinea pigs were tested for freedom from agglutinins prior to use.—E. J. Pullinger.

I. Hieronymi, E. (1932). Die Brucella-Bang-Infektion des Pferdes und ihre Beziehung zu chirurgischen Leiden in der Widerrist-und Genickgegend. [*Brucella abortus* **Infection of Horses and its Relation to Surgical Disorders of the Withers and Poll**].—*Deuts. tierärztl. Wschr.* **40.** 593-595. [11 refs.]

II. Panisset, L., & Delbé, P. (1932). Le Bacille de Bang, *Brucella abortus*, agent pyogène chez le cheval. [*Br. abortus*, **as a Pyogenic Agent in the Horse**].—*Rev. gén. Méd. vét.* **41.** 670-675. [12 refs.]

III. Beijers, J. A. (1932). Brucella-Bang Infectie bij het Paard. [*Br. abortus* **Infection in Horses**].—*Tijdschr. Diergeneesk.* **59.** 1221-1225. [Summaries

in English, French and German : abst. from orig.]

I. After discussing the literature upon this subject, the author describes briefly 12 horses showing lesions of the poll or withers which gave trouble in treatment. Ten of these animals gave positive agglutination or complement-fixation results to *Br. abortus*.

II. The type of lesion generally found with brucella infection is described. The seat of infection is generally the poll or withers. The lesion is a moderately sensitive swelling fluctuating at certain points with a sero-fibrinous material content.

The author has studied 14 cases of which 13 were serologically positive and on two occasions a cultural diagnosis was made of *Br. abortus*.

The agglutinin content of the serum of two mares was traced. In December the titres ranged between 1 : 100 and 1 : 1,000. By January both horses reacted negatively, a few days later the one showed a titre of 1 : 100 and the other 1 : 1,000. By February both were negative again.

III. Outstanding symptoms of brucella infection of horses are a continuous fever (from 38° to 40°C.) which resists the action of antipyretics, a moderate hyperleucocytosis and laziness. The appetite, faeces and urine are normal. Local inflammatory processes appear later. In the consideration of differential diagnosis tuberculosis should be remembered. The agglutination test confirms diagnosis.

Treatment consists of rest. The course of the disease is about two months.

—E. J. Pullinger.

Krüger, H. (1932). Ueber das Vorkommen von Bangbakterien im Fleisch geschlachteter Rinder. [**The Presence of Bang Bacteria in the Flesh of Slaughtered Cattle**].—*Deuts. tierärztl. Wschr.* **40.** 481-484. [27 refs.]

The author records the results of preliminary experiments carried out on guinea pigs to determine (a) the possibility of recovering *Br. abortus* from the blood of cattle positive to the agglutination test; (b) whether the beginning of infection is associated with an increase in temperature and (c) how long *Br. abortus* remains in the blood stream after artificial inoculation. From the blood of infected cattle showing agglutination titres between 1 : 100 and 1 : 2,000 it was not possible to recover *Br. abortus* either by cultivation in lactose glycerol broth or by inoculation of guinea pigs. There was a transitory rise in temperature about the third day following intracardial inoculation of culture, but it was only possible to recover organisms from the blood stream up to a period of 15 minutes after injection. From five cattle whose blood sera were positive to the agglutination test, the following sites were examined for *Br. abortus* by cultural methods and by guinea pig inoculation—milk, uterus, iliac and ischiatic glands, pelvic muscle and the muscular pillar of the diaphragm. Three guinea pigs showed agglutination titres of 1 : 2,560 and *Br. abortus* was recovered in pure culture from the liver. Of these three guinea pigs, two were infected by milk and mammary gland of one cow and the third by diaphragmatic muscle from another cow.

In another experiment 25 cattle of all ages, chosen without respect to the reaction of their bloods to the agglutination test, were examined in the following sites : cervical muscle, coccygeal muscle and muscular pillar of the diaphragm. On the 75 sites tested, *Br. abortus* was recovered from two and in each case the affected tissue was the pillar of the diaphragm. The first was from a heifer whose serum did not contain brucella agglutinins and the other from a three-year-old bull also negative to the agglutination test.

Experiments to determine how long *Br. abortus* remained virulent in meat preserved at a temperature of from 3° to 5°C. showed that it was still pathogenic for guinea pigs after storage for 14 days.—S. J. Edwards.

VIOLLE, H. [Membre du Conseil supérieur d'Hygiène publique de France]. (1931). La Fièvre ondulante. [**Undulant Fever**]. pp. 114. 4 figs. Paris: Masson et Cie. [8vo.] [Fr. 18].

This volume is one of the French series of books entitled "Médecine et Chirurgie Pratiques." The subject of undulant fever is treated in a clear, concise and systematic manner. There are eight chapters dealing consecutively with general remarks, aetiology, contagion, diagnosis, course, differential diagnosis, prophylaxis and treatment of the disease. Throughout the book brucella infections are treated as being for all practical purposes one disease, whether occurring in man as undulant fever, in goats and sheep as Mediterranean fever, or in cattle as contagious abortion. This places the author under the necessity of explaining why undulant fever in man is so rare in Britain when bovine abortion occurs, according to the author, to the extent of nearly 50 per cent. The explanation given is that the brucella in the milk of the cow in Britain has immunized human beings against the brucella from the goat. In referring to the practice of keeping a goat in the byre the author accepts the view that cattle derive their relative immunity, when such occurs, by frequent slight infections from the goat, and he suggests that there is an analogy between such immunity, in man and the cow, and what occurs in tuberculosis when infection takes place in small doses frequently repeated. If this is the case one would expect the whole population of Britain to give positive serological reactions, but there is no evidence of this. The chapter on differential diagnosis in man, using the agglutination test and the intradermal injection of endotoxin, and the chapter dealing with human prophylaxis as compared with prophylaxis in animals are of particular interest to veterinarians. The administrative measures outlined against brucella infections in animals would be quite impossible of enforcement in Great Britain.—S. H. GAIGER.

ROBINSON, G. L. (1932). **The Growth of *B. pyocyaneus* in Synthetic Media.**—*Brit. J. Exp. Path.* **13.** 310-317. 1 fig., 2 tables. [7 refs.]

It is shown that, for minimal growth of *Pseudomonas pyocyanea* on a variety of synthetic media, supplies of phosphorus, carbon, nitrogen and magnesium are essential. The nitrogen and carbon must be supplied in substances that the organism can metabolize. Anaerobic growth takes place if the nitrogen is supplied as nitrate. Oxalates support growth anaerobically, but not under aerobic conditions. Pigment formation is susceptible to two factors:—(a) the degree of atmospheric oxidation and (b) the concentrations of the essential substances. Excess phosphate inhibits pigment production.—W. R. WOOLDRIDGE.

PULLAR, E. M. (1933). **Limberneck (Botulism) in Ducks.**—*Austral. Vet. J.* **9.** 26-30. 3 figs., 1 table. [5 refs.]

This enzootic in Muscovy ducks resulted in a mortality of 58 per cent. causing the deaths of 68 ducks, all of which died within 48 hours of eating an unsalted pig's head which had been boiled and had stood on a warm stove overnight. The disease was confirmed by bacteriological examination and experimental reproduction of the condition in ducks and guinea pigs with material from the pig's head, and it was found that 1·5 c.c. of type C antiserum gave protection to guinea pigs against 2 M.L.D. of toxin prepared from culture obtained from the original material. The M.L.D. of a whole culture given subcutaneously to a 250 g. guinea pig was 0·005 c.c.

It is stated that this is the first record of botulism in domesticated birds in Australia.—EDWARD F. PECK.

DISEASES CAUSED BY PROTOZOAN PARASITES.

YAKIMOFF, W. L., & IWANOFF-GOBZEM, P. S. (1932). Veränderung der leukocytären Formel bei Kaninchencoccidiose. [**Alteration of the Leucocyte Formula in Coccidiosis in Rabbits**].—*Arch. wiss. prakt. Tierheilk.* **65.** 188-194. 2 tables. [8 refs.]

The authors point out that, with the increase of intensive rabbit farming, diseases of rabbits assume a greater importance, and that, among these, coccidiosis takes a very prominent place.

A considerable amount of space is given to the figures for the leucocyte formula of rabbits which have been published by a number of investigators. It is pointed out, however, that many of these figures are not reliable as being those of normal rabbits, because of the widespread occurrence of coccidiosis.

The rabbits used in the tests were, according to the authors, cleared of their parasitic infection by treatment with ichthargan, methylene blue, chinosol, creolin, etc. before the leucocyte counts were taken.

From their own figures the authors conclude that coccidiosis causes an increase in the number of eosinophiles and lymphocytes at the expense of the pseudo-eosinophiles.

Successful drug treatment reduces the percentage of eosinophiles and, if the drug used is an aniline dye, there is an increase in the number of mast cells.

In healthy rabbits the number of eosinophiles does not exceed 2 per cent., but if healthy rabbits are placed in dirty cages they become infected and there is an increase in the percentage of eosinophile leucocytes.—A. LESLIE SHEATHER.

I. BALOZET, L. (1932). Les coccidies du mouton et de la chèvre. Cycle évolutif de *Eimeria nina-kohl-yakimovi* Yakimoff et Rastegaieva 1930. [**The Coccidia of the Sheep and Goat. Developmental Cycle of** *Eimeria nina-kohl-yakimovi* **Yakimoff and Rastegaieva 1930**].—*Arch. Inst. Pasteur Tunis.* **21.** 88-118. 2 plates, 2 tables. [85 refs.]

II. BALOZET, L. (1932). Les coccidies des petits ruminants de la Tunisie. [**The Coccidia of Small Ruminants in Tunis**].—*Bull. Soc. Path. exot.* **25.** 710-715. 5 figs. [7 refs.]

III. BALOZET, L. (1932). Étude expérimentale d'*Eimeria nina-kohl-yakimovi*, W. L. Yakimoff et Rastegaieva 1930. [**Experimental Study of** *E. nina-kohl-yakimovi*, **W. L. Yakimoff and Rastegaieva, 1930**].—*Ibid.* 715-720. [4 refs.]

I. The first part of the article consists of an extensive review of the literature upon the coccidia of sheep and goats, followed by an analysis and a discussion. The view is expressed that present knowledge of the subject is in a confused state and that this is partly due to the fact that, in the past, it has often been assumed that *Eimeria faurei* is specific to the sheep and *E. arloingi* to the goat.

The authors studied oocysts from latent infections in sheep and goats in Tunis. Forty-seven out of 68 sheep and 30 out of 41 goats were found to be discharging oocysts in the faeces and the morphology of these was studied in detail. All the coccidial species which have been described were recognized and, with the exception of *E. intricata*, which was encountered in two sheep, all species were found to be common to sheep and goats ; few pure infections were encountered. The following characters were considered in the indentification of the oocysts :—*E. intricata*—very large, oval, distinctly brownish, an irregular outer surface, and a prominent, refractile, micropyle cap ; *E. arloingi*—oval, tending to be oviform, average dimensions 30 × 21μ and a variable micropyle cap ; *E. faurei*—oviform,

micropyle at attenuated end, average dimensions 31 × 22μ ; *E. nina-kohl-yakimovi* —oval approaching spherical, no micropyle or micropyle cap and dimensions 19 × 16μ ; *E. parva*—spherical, very translucent, average dimensions 17 × 13μ and delayed segmentation (doubt is expressed as to whether the last named has been correctly identified).

A goat acquired by the laboratory, for purposes unconnected with the investigations recorded, died of acute coccidiosis and the species concerned was identified as *E. nina-kohl-yakimovi.* A full description of the symptoms and lesions is given. Two goats and a lamb were fed with oocysts from this animal. One goat developed an acute infection, but recovered and oocysts which had been recognized before infection reappeared in the faeces. The other was slaughtered at the height of the disease and material for histological and pathological examination collected. The developmental cycle of the parasite was studied in sections of the intestinal wall and scrapings from the mucous membrane. Except that the schizonts contained a larger number of merozoites, no essential difference was recognized between this disease and that caused by *E. arloingi.*

A table for the indentification of the species is given.

II. & III. These are modified reports of I.—R. S. Roberts.

Macdonald, R. A. S., & le Roux, P. L. (1932). **Inoculation against Redwater and Gallsickness.**—*Ann. Bull. Dept. Anim. Health, N. Rhodesia.* pp. 43-44.

Animals from Southern Rhodesia and South Africa do not carry a sufficiently high resistance to Northern Rhodesian strains of redwater and gall-sickness. Investigations are in progress to find strains of piroplasms suitable for immunization, but at present the process is lengthy and is only suitable for animals of the correct age and in perfect health. The authors recommend the adoption of seven-day dipping combined with ear and tail dressing and hand examination for ticks as the most practical method of protecting imported animals.

—U. F. Richardson.

Dupont, O. (1932). Quelques considérations sur la pathogénie et la prophylaxie de l'association *Babesia-Anaplasma-Salmonella* dans les élevages améliorés des pays tropicaux et subtropicaux. [**Factors to be considered in the Pathogenicity and Prophylaxis in the** *Babesia-Anaplasma-Salmonella* **Complex in Graded Herds in Tropical and Sub-Tropical Countries**].—*Rec. Méd. vet. exot.* **5.** 76-79. [8 refs.]

In Brazil there is a high mortality from paratyphoid infection among calves of European grade herds. This disease becomes of importance when the calves have been rendered anaemic by attacks of piroplasmosis or anaplasmosis. The author quotes Viljoen and Martinaglia who stated that, under similar conditions in South Africa, the incidence of calf mortality seems to have been reduced considerably by the elimination of tick-borne diseases, by dipping, combined with regular feeding, vaccination and improved sanitation.—U. F. Richardson.

Hornby, H. E., & Bailey, H. W. (1932). **Research on Trypanosomiasis.**—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., Tanganyika. 1931.* pp. 10-25. 10 tables.

Diagnosis.—The absence of a reliable method of diagnosis in cattle is emphasized. Cases of trypanosomiasis can be divided into (1) cattle affected with trypanosomiasis and with trypanosomes demonstrable microscopically in the blood or gland juice ; (2) cattle apparently affected with trypanosomiasis, but without any demonstrable flagellates ; (3) cattle in good health with trypanosomes

frequently demonstrable and (4) cattle in good health, but suspected of infection although parasites are not demonstrable ; this last includes treated animals whose complete recovery is doubted.

The complement-fixation test has only proved valuable in the case of *Trypanosoma brucei*, but in tropical laboratories the test is not practicable as the titre of haemolytic serum from rabbits is usually low and guinea pig blood appears to be deficient in complement. Attempts were made to utilize the adhesion phenomenon in the diagnosis of *T. congolense* infection, but the phenomenon did not occur if a different strain of *T. congolense* was used ; the test has, therefore, little value for diagnosis.

TRANSMISSION.—Spread of trypanosomiasis in areas free from tsetse fly is discussed and an experiment to ascertain the importance of *Haematopota* was undertaken, but was interrupted by lions. The authors lean to the hypothesis that *Culex fatigans* may be a transmitter.

TREATMENT.—The treatment recommended for infection by *T. congolense* or *T. vivax* in cattle is five doses of " antimosan " (40 c.c. a dose) with the interval of a week between each dose ; or 25 c.c. of a 4 per cent. aqueous solution of tartar emetic can be used. If a relapse occurs the course is repeated, but if a second relapse occurs a double dose of " antimosan " is recommended. The method of action of antimony is discussed and a case is recorded tending to the view that there is an ascending efficiency with repeated doses of tartar emetic. Although tartar emetic is instantly fatal *in vitro* to *T. congolense* in very high dilution, yet a case is recorded when an estimated dilution of 1 : 4,000 in the jugular vein, ligatured and left one hour *in situ*, failed to kill the trypanosomes.

PATHOLOGY.—The question of the pathogenesis of the anaemia due to *T. congolense* is discussed, but no conclusion is reached. The authors consider that *T. brucei* and *T. vivax*, unlike *T. congolense*, show no predilection for the capillaries as there is no increase in numbers in the circulation on the administration of antimony, nor is their concentration in the ear blood related to the temperature of the ear.

IMMUNOLOGY.—Premunity against one strain of *T. congolense* was not found to give any protection against another strain of the same trypanosome and the same applies to premunity in *T. brucei* infection. The failure of an attempt to maintain cattle in a fly belt by periodic treatment with tartar emetic is cited as confirmation of these results. The existence of immune herds in " fly " areas is cited as evidence that sufficient immunity may be obtainable, but it is pointed out that such immune cattle occurring in nature are dwarf and anaemic. [This may be due to causes not connected with trypanosomiasis].

Amongst notes on some interesting work on game susceptibility, it is recorded that it proved impossible to infect a young female African elephant with either *T. congolense*, *T. vivax* or *T. brucei* and that a greater kudu inoculated with *T. congolense* became infected and died eight months later. Attention is, however, drawn to the finding of *T. congolense* in a smear from an African elephant in 1931.

—U. F. RICHARDSON.

DUKE, H. L. (1932). **The Polymorphic Trypanosomes of Damba Island, Victoria Nyanza. I. Their Ability to infect Man.**—*Ann. Trop. Med. & Parasitol.* **26.** 191-206. 3 tables. [4 refs.]

There was sleeping sickness on Damba Island up to 1909 when the survivors were removed. Strains of polymorphic trypanosomes from wild *Glossina palpalis* of the island were investigated in 1911, 1920, 1924, 1926 and 1932. Whilst the 1911 strain resembled *Trypanosoma gambiense*, the 1920, 1924 and 1926 strains

showed some modification and the 1932 strain differed from earlier strains in one important respect, the change being in the direction of *T. brucei*. No infection resulted when tests were carried out on four human volunteers.

The author remarks that cattle flourished on the Sesse islands at the time of the sleeping sickness epidemic and that they and the situtunga may have harboured *T. brucei*.

It is suggested that the modification of the trypanosome strain occurs through living in a host which is tolerant to it (situtunga) and that CORSON's experiment in which *T. rhodesiense* failed to lose its virulence to man after passage through goats is not comparable, as the goats died in three weeks and the trypanosome could not hope to survive in these animals in nature.—U. F. RICHARDSON.

ABELEIN. (1932). Die Trichomonadenseuche des Rindes und das Scheidenkatarrproblem. [**Infection of Cattle with Trichomonas and the Problem of Vaginal Catarrh**].—*Münch. tierärztl. Wschr.* **83.** 253-257, 279-285, 292-296, 305-309 and 318-322. [57 refs.]

This article deals with a disease of cattle prevalent in South Germany, Switzerland, Austria and North Italy. It is characterized by abortion in the early months of pregnancy, the frequency of sterility and pyometra and the history of transmission by certain bulls.

The claim that the disease is due to trichomonas is based on the detection of the protozoa in practically all the typical cases examined (in uterine discharges of 144 out of 145 cows, and in preputial secretion of 19 out of 21 bulls), the absence of trichomonas in healthy animals, the experimental evidence that pure trichomonas material will cause early abortion and the exclusion of infection with *Br. abortus* or an ultravisible virus (reported by REISINGER).

Trichomonas was detected in infected animals by examining fresh smears of discharge under a 6 objective and the numbers varied from the detection of one after prolonged search to 20 per field in cows and one per field in bulls. In order to obtain pure material for experimental work, the intra-uterine inoculation of gravid guinea pigs was practised and, even when using contaminated material, it was often possible to get pure cultures of the trichomonas from the peritoneal or pleural cavities. In describing attempts to cultivate the organism *in vitro*, the author records that he encountered a very thin ribbon-like form of the trichomonas, without nucleus or flagella.

The experiments which were carried out on seven virgin heifers were not very conclusive. Out of four animals treated shortly after service with pure trichomonas material, all showed trichomonas infection, one aborted after 35 days and one became barren, but the other two after failing to hold to the first services eventually became pregnant. Of the three controls, two carried their calves nine months and the other became barren. The controls were treated with a filtrate of discharges and with bacterial cultures made from infected material from the uterus in a case of pyometra.—U. F. RICHARDSON.

ROBERTSON, A. (1932). **Note on a** *Trichomonas* **sp. cultivated from the Gut of a Sheep.** *Ditrichomonas ovis* **(nov. sp.).**—*Vet. J.* **88.** 151-157. 1 plate. [3 refs.]

This article reports the isolation of a species of *Trichomonas* from a sheep from a London abattoir. The organism grew at 37°C. on an agar slope covered with Tanabe's fluid. It grew better on Tanabe-rice-glucose-agar. The length varied from 4 to 7μ and the width from 3 to 6μ. The nucleus was round or oval. The lateral flagellum after passing down the side of the body became free to a

variable extent. The undulating membrane was poorly developed. One of the two anterior flagella was longer than the other.

In view of the presence of only two anterior flagella and the small size of the organism, the author concludes that it is not *T. ruminanteum* and suggests the name *Ditrichomonas ovis*.—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

I. TERBRÜGGEN, F. (1932). Ueber die Haltbarkeit des Maul- und Klauenseuchevirus in Milch und Molkereiprodukten. I. Mitteilung. **[The Survival of the Virus of Foot and Mouth Disease in Milk and Dairy Products. Part I].** —*Deuts. tierärztl. Wschr.* **40.** 129-134. 5 tables. [20 refs.]

II. TERBRÜGGEN, F. (1932). Ueber die Haltbarkeit des Maul- und Klauenseuchevirus in Milch und Molkereiprodukten. II. Mitteilung—Käse und Molken. **[The Survival of the Virus of Foot and Mouth Disease in Milk and Dairy Products. Part II. Cheese and Whey].**—*Ibid.* 529-533. 8 tables. [8 refs.]

I. The author added to fresh raw milk virus in the form of lymph taken from the primary vesicles in guinea pigs, in the proportion of 1 : 20. The survival of the virus was determined by removing samples at intervals and inoculating them by scarification into the metatarsal pads of guinea pigs. The virus survived in fresh raw milk kept at 37°C. for 12 hours, at room temperature (from 17° to 20°C.) for 25 hours and at 5°C. for 12 days. Other experiments were made to determine the period of survival of the virus in cream, skim milk, salted and unsalted butter and buttermilk. In cream the virus survived at 37°C. for 26 hours, at from 17° to 20°C. for three days and at 5°C. for 10 days, i.e., somewhat longer than in skim milk, in which it survived at 37°C. for 10 hours, at from 17° to 20°C. for 30 hours and at 5°C. for 9 days.

The virus survived longer in salted than in unsalted butter prepared from fresh cream. The maximum period of survival recorded in the case of the former was 45 days and in the case of the latter 26 days, when the butter was kept in the ice-chest at 5°C. Under similar conditions the virus survived for 14 days in buttermilk and for 6 days in the water in which the butter was kneaded. The virus survived for 26 hours in unsalted butter kept at 17°C. without previous cooling, while in salted butter, buttermilk and in the " kneading water " under these conditions it survived for periods of 4 days, 20 hours and 20 hours respectively.

In another experiment, unsalted butter was placed at room temperature and then in the ice-chest for alternate periods of 24 hours. The maximum period of survival of the virus in this experiment was 9 days in unsalted and 18 days in salted butter.

The virus did not survive in butter made from sour cream.

[These observations, therefore, confirm and extend those reported by Galloway. (1931).—*Fourth Progress Report of the Foot-and-Mouth Disease Research Committee, Ministry of Agriculture and Fisheries, Great Britain.* p. 248.—see this *Bulletin.* **2.** 145.—with regard to the survival of virus added to " chilled " raw milk. In this report it was stated that the virus survived for from 15 to 17 days when the milk was kept at 4°C. and from 7 to 9 days when kept at 18°C. (see Terbrüggen above 13 days at 5°C. and 25 hours at from 17° to 20°C.) It was also pointed out that the virus was soon killed when the milk became sour and definitely acid and that how soon this happens varies with the bacterial content of the milk at the beginning of the experiment and the temperature at which the milk is kept. This observation

has been amplified by Terbrüggen who has recorded the pH concentration of the milk and its products under different conditions and shows the progressive acidification, fatal to the virus, which takes place. The fact that the souring takes place more rapidly due to the initial multiplication of bacteria in milk that has not been " chilled " would serve to explain the shorter survival of virus in milk at from 17° to 20°C., 25 hours in Terbrüggen's experiments, as compared with from 7 to 9 days under similar conditions in the experiments referred to here. BEDSON, MAITLAND & BURBURY (1927).—*Second Progress Report of the Foot-and-Mouth Disease Research Committee, Ministry of Agriculture and Fisheries, Great Britain.* p. 73.—found that when virus was mixed with salted butter, the butter kept at room temperature from 15° to 20°C. was infective after 2, but not 3 weeks].

II. A series of observations are recorded on the effect of the processes employed in making cheese on the survival of the virus. The virus was destroyed, tests being made on both whey and curd, by the heating process employed in the manufacture of Emmenthaler cheese. In the case of Neufchâtel cheese and cheese made from sour milk the virus is destroyed by the acidity which develops during the souring process.

In those cheeses, in the manufacture of which only low heating temperatures are used (from 30° to 35°C.) and in which the degree of acidity allowed to develop is not great, the presence of the virus may still be demonstrated in both the whey and the curd after the process is completed, but only for a relatively short time. In the case of Tilsit cheese the virus may sometimes persist in the whey for 24 hours and in the curd for 6 hours ; in Edam cheese in the curd and in the whey for 22 hours ; in Limburg cheese, in the whey for 24 hours and in the curd for 14 hours. In Camembert and Brie the virus was demonstrated in the whey and curd at the time of preparation, but not at the 17th to 20th hour afterwards. On referring to the tables given it will be seen that even in the manufacture of Tilsit, Edam and Limburg cheese, the degree of acidity which may sometimes develop during the process may be sufficient to destroy the virus much sooner than in the time intervals given above.

Since the virus has never been demonstrated in the curd of any cheese later than the 22nd hour after manufacture, there can be no virus survival in ripened cheese.

The fact that virus may persist in whey for a short time is not without a certain degree of importance as this product is frequently fed to susceptible animals.—I. A. GALLOWAY.

DIERNHOFER, K. (1932). Verhütung der Uebertragung der Maul- und Klauenseuche auf den Menschen. [**Prevention of the Transmission of Foot and Mouth Disease to Man**].—*Wien. klin. Wschr.* **45.** 920-921.

The author gives a brief account of foot and mouth disease, enumerating the species of animals that are susceptible and quotes the published instances of infection in human beings, in which it runs a benign and rapid course, lesions being limited to the hands or feet [no mention of mouth lesions]. Infection in human beings can follow the drinking of milk from an infected cow or direct contact with infected animals, most commonly by way of scratches on hands. The principles of prevention are obvious and in certain countries the sale of milk from infected animals is forbidden by law.—J. E.

EVANS, S. A. (1932). **Rinderpest Research.**—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb., Tanganyika, 1931.* pp. 25-32. 6 tables.

Rinderpest vaccine made with glycerol was sometimes found to be virulent

up to three weeks after preparation. The vaccine now used is made by mincing the spleens and lymphatic glands of virus producers slaughtered seven days after inoculation with virus. 8 c.c. of 50 per cent. glycerol is added to each 2 g. of pulp, formol added to make a strength of 1 : 1,000, the mixture macerated over night, shaken and filtered through gauze and bottled for use. The average yield from one young ox is 229 doses at a 10 c.c. dose. Tested on the sixth day, all brews proved avirulent and some brews which were tested on the third day also proved avirulent. Samples of vaccine stored 19 weeks in light at room temperature (from 22° to 30°C.) gave excellent protection, but attenuation occurred with longer storage. Fourteen vaccinated animals, tested with virus at periods from 11 to 49 weeks after vaccination, gave definite thermal reactions but there was no mortality. When triple vaccination was used some animals gave blocked-out reactions, but the author does not consider it better than single vaccination. Animals immunized by vaccine followed by virus 13, 20 and 27 days later, all proved immune when tested at intervals between 4 and 33 weeks after the virus inoculation.

In view of the reports on goats and sheep as reservoirs of rinderpest virus, a few imported goats at the rinderpest hospital, which had had every opportunity of contracting infection by contact, were inoculated with virus. A thermal reaction occurred in every animal and, on subinoculation into cattle, rinderpest was produced. The author concludes that these goats were highly resistant to contact infection.

—U. F. Richardson.

Rossi, P. (1932). Diagnostic de la typho-anémie infectieuse du cheval. [**The Diagnosis of Infectious Anaemia of the Horse**].—*Rev. vét. et J. Méd. vét.* **84.** 545-565. [62 refs.]

This is a résumé of the diagnostic methods which have been recommended by various workers.

Haematology.—In infection there is a decrease in the red and white cell counts and a relative increase of the monocyte count. The speed of coagulation of the blood is slowed down. The speed of sedimentation of the red corpuscles is increased. There is an increased resistance of the red cells to lysis by hypertonic saline solutions.

Serology.—In infection there is a decrease of the total serum protein with an increase of the globulin albumin ratio. Infected serum is flocculated by perchloride of mercury solution up to dilutions of 1 : 100,000. Haemagglutinins appear in infected serum which agglutinate the red blood corpuscles of a rabbit (previously infected with virus) to a titre of 1 : 20.

Animal Inoculation.—The inoculation of a rabbit with virus-containing material is followed by a reduction of red cell count. Chickens inoculated show a round-cell infiltration of the spleen and haemosiderin accumulation. Inoculation of a horse is usually followed by a typical onset of the disease provided that the horse used is not already undergoing a latent infection.

Of the tests described, the horse inoculation is by far the most reliable, but its disadvantages are obvious. Fowl inoculation is still in the experimental stage, but the method is promising. All the other methods described fail through being insufficiently specific or too complicated for use.—E. J. Pullinger.

I. v. Mócsy, J. (1932). Die seriologischen Untersuchungsmethoden bei der infektiösen Blutarmut der Pferde. [**Serological Diagnostic Methods of Equine Infectious Anaemia**].—*Arch. wiss. prakt. Tierhlk.* **65.** 451-459.

II. Weidlich, N. (1932). Untersuchungen zur Feststellung der ansteckenden

Blutarmut der Pferde, zugleich ein Beitrag zur Erkennung dieser Seuche. [**An Investigation of the Diagnosis of Infectious Anaemia of Horses and a Contribution to the Knowledge of this Disease**].—*Prag. Arch. Tiermed.* **12.** 149-171. 3 tables. [47 refs.]

I. The author surveys his subject under the following four headings :—

(a) Haemolytic and antihaemolytic properties of infected serum. The principles underlying the anti-saponin and the anti-oleic acid haemolysis factors are discussed and also Meinicke's lipoid flocculation reaction.

(b) Specific immune bodies in infected serum. The complement-fixation, conglutination and precipitin tests receive brief mention.

(c) Serum instability tests. Nine such tests are described depending upon the relative instability of the serum-albumen of infected animals compared with normal ones when subjected to various precipitating factors.

(d) Diagnostic animal tests. Rabbits and pigeons are infected with virus and thereafter their red blood corpuscles are agglutinated by infected horse serum and not by normal serum. Fowls inoculated with virus show typical *post-mortem* changes of round-cell infiltration and haemosiderin deposition in the liver.

The author concludes that none of these tests are of much value in diagnosis ; they are not sufficiently specific and tend to fail particularly in the diagnosis of subacute and chronic cases. Furthermore, many are cumbersome to use.

II. This article is a description of the study of infectious anaemia in army horses. The red blood corpuscle count is shown to fall steadily with the increase in duration of the disease. There is a corresponding fall in the haemoglobin content and in the corpuscle-plasma ratio.

Post-mortem appearances are compiled from 17 cases including acute, subacute and chronic types of the disease. Histological changes occur mainly in the reticulo-endothelial system and consist of erythrophagocytosis, deposition of haemosiderin and desquamation of histiocytes.

The findings are in general in keeping with those of earlier workers. The *post-mortem* findings and more particularly the histological descriptions are valuable additions to our information on this disease.—E. J. Pullinger.

Brogan, E. H. (1932). **Heartwater.**—*Ann. Bull. Dept. Anim. Health, N. Rhodesia.* pp. 40-42.

This article is a general description of the disease as it occurs in Northern Rhodesia. The transmitters are given as *Amblyomma hebraeum* and probably *A. variegatum.* Goats, sheep and cattle are susceptible, the high grades being least resistant. In the event of an outbreak it is recommended to move the animals to new pasture and whilst the outbreak continues to move them every three weeks. In addition, five days dipping should be adopted with all animals on the farm to attempt to clear it of ticks.—U. F. Richardson.

I. Ramiah, B. (1932). **Paralytic Rabies in an Elephant.**—*Ind. Vet. J.* **9.** 142-144.

II. Greval, S. D. S. (1932). **Rabies in the Mongoose.**—*Ibid.* 159-163. 1 table. [3 refs.]

I. An elephant, bitten by a rabid dog, was given antirabic treatment from the 9th day onwards, but developed paralytic rabies with rather atypical symptoms on the 43rd day and died 9 days later. The diagnosis was confirmed by microscopic examination of the brain.

II. Three cases of mongoose bite are reported in which the history of the attack was suggestive of rabies. The brain of one mongoose was found to contain

Negri bodies. One human death, apparently due to rabies, followed a bite, but no microscopic or other evidence is afforded. The possibilities of rabies passing from wild to domestic carnivora are discussed.—NORMAN HOLE.

BALOZET, L. (1932). Le virus rabique fixe de l'Institut Pasteur de Tunis évolution et état actuel. [**The Evolution and Present Attributes of the Pasteur Institute (Tunis) Strain of Fixed Rabies Virus**].—*Arch. Inst. Pasteur Tunis.* **21.** 130-143. 1 chart. [15 refs.]

It is well known that the original Pasteur strain of fixed rabies virus has undergone important modifications as a result of constant passage during the course of years. These modifications have varied in the different institutes where the strain has been maintained. In the same way other strains of fixed rabies virus which have been recovered differ from one another in many ways, although they are immunologically identical.

The importance of comparing the different strains of fixed rabies virus has been recognized especially with regard to such attributes as pathogenic, physical and relative immunizing properties and association or non-association with paralytic symptoms when used for vaccination.

The author here records the pathogenic and physical properties of the fixed rabies strain used at the Pasteur Institute, Tunis. The strain originally came from the Pasteur Institute in Paris in 1901, at which time it had been passaged 600 times through rabbits. Since then it has been passaged 750 times in Tunis, a total of 1,350 passages.

The incubation period in rabbits inoculated intracerebrally is remarkably short, from $4\frac{1}{2}$ to 5 days ; the time elapsing between inoculation and death is from $5\frac{1}{2}$ to 6 days. This is the shortest period known for a descendant of the original parent Pasteur strain. The Odessa Pasteur strain kills in from 6 to 7 days. The majority kill in from 8 to 9 days. No satisfactory explanation for the shortening of the incubation period in the case of the Tunis strain has been found. It has taken place gradually and a chart is given to illustrate this. It is noted that the Tunis and Paris Pasteur strains produce rabies in rabbits inoculated by the intra-ocular route while the Pasteur strains of Rome, Tangier and Algiers do not. The Tunis strain is not infective for the rabbit by the intramuscular route, but the Paris strain is infective. Dogs can be infected by the intramuscular and intra-ocular route with both the Tunis and Paris strains. Subcutaneous injections of the Tunis strain into dogs produce rabies in the majority of instances.

[The author has submitted the information recently, in a letter to the abstractor when sending this strain (Tunis) that, since the publication of the observations under discussion it had been noted that the aptitude of the virus to produce rabies in dogs by subcutaneous inoculation appeared to have diminished slightly].

The guinea pig can be infected by the Tunis strain injected intra-ocularly and intramuscularly, but not subcutaneously. Mice cannot be infected by the subcutaneous or intramuscular route. Two monkeys could not be infected by the subcutaneous route.

The Tunis strain is very sensitive to desiccation ; 50 per cent. of cords are avirulent on the 3rd day (see 6th to 7th day in the case of Paris Pasteur strain). It is interesting to note that the Tunis strain of fixed rabies virus has also been passaged 106 times through dogs by intracerebral inoculation and, as a result, it has shown no tendency to become more virulent. The virus of dog passage when inoculated into rabbits by the intracerebral route produces paralytic symptoms in 5 days and death in 9 days and when inoculated by the intramuscular route kills

in 10 days [see virus of rabbit passage above]. The virus of rabbit and that of dog passage kill dogs when inoculated by the intracerebral route in 8 days, but while the former produces rabies in dogs when inoculated by the intramuscular subcutaneous or intra-ocular routes, the latter does not.—I. A. GALLOWAY.

LIEGEOIS, F. (1932). Syndrome d'automutilation à la suite de poliomyélite supérieure chez le chien. [**Automutilation Syndrome following Superior Poliomyelitis in the Dog**].—*Ann. Méd. vét.* **77.** 241-260. 9 figs. [13 refs.]

The author records his observations on animals which showed nervous troubles and automutilation as a result of an attack of distemper (4), as a result of an attack of demodectic mange complicated by purulent acne (1), on an animal six years of age which showed the same symptoms after an attack of broncho-pneumonia and conjunctivitis and on one animal in which there were nervous symptoms, but no definite diagnosis is given. Normal intelligence was maintained in five of his patients and no mention is made of the psychical state of the other two. He points out that the manifestations of automutilation and autophagia are due to an exacerbation of the tactile sensibility in and a loss of the heat and pain sensibility from the mutilated peripheral areas supplied by a pair or by several neighbouring pairs of spinal nerves. Since this dissociation of the sensibilities [thermo-analgesic dissociation] simulated very closely that seen in man in the course of posterior poliomyelitis, syringomyelia, haematomyelia or in the course of lesions of the antero-lateral part of the white matter of the cord, the author carried out researches on the cord segments which corresponded to the mutilated peripheral areas. He was able to demonstrate lesions in the superior horn of grey matter of all his cases. No lesions were found in the brain.

He discusses the differing views of earlier writers on the origin of automutilation, some believing that it is due to psychical troubles, others to sensory troubles and mention is made of one author who stated that automutilation and autophagia are syptomatic of a myelitis of the superior columns of white matter. The present author bases his views on the lesions which he found and on the interpretations which neurologists give on the conduction or origin of pain.

He gives a description of the anatomical arrangement of the fibres of the ascending branches of the dorsal roots of spinal nerves which are concerned with heat, pain and touch sensation and shows that an inflammatory lesion in the superior horn of grey matter or in the grey commissure is capable of blocking sensations of heat and pain from a peripheral area, but incapable of blocking touch sensations from the same area. The author states that the inflammatory focus in the grey matter is responsible for stimulating the tactile fibres which lie in close proximity and, therefore, responsible for an exacerbation of the touch sensibility in the peripheral area, which has lost sensibility to heat and pain.

Because inferior poliomyelitis frequently co-exists with superior poliomyelitis, sensory troubles are frequently accompanied by motor ones (chorea and paralysis). Treatment of cases of automutilation has not met with success.—D. R. WILSON.

DURAND, P. (1932). Le chien réservoir de virus de la fièvre boutonneuse. [**The Dog as a Carrier of the Virus of Marseilles Endemic Typhus**].—*C. R. Acad. Sci. Paris.* **194.** 918-919.

Two puppies, aged four to six weeks, were inoculated subcutaneously with an emulsion of crushed dog ticks (*Rhipicephalus sanguineus*) collected from the dog-pound in Tunis. No febrile or other symptoms followed. Pooled blood taken from the puppies ten days after inoculation was injected into a human subject, who showed on the 12th day a fever which lasted seven days, headache,

joint pains and skin eruptions on the palms of the hands and the soles of the feet.

[This mild typhus-like fever, first identified by CONOR and BRUCH in Tunis in 1910, has been described in Marseilles (" fièvre exanthémique de Marseilles ") and other Mediterranean ports and studied recently by a number of French workers. It had been shown to be conveyed to man by the dog tick—DURAND and CONSEIL, (1930)—and it can be propagated hereditarily in this tick—BLANC and CAMINOPETROS, (1931) and BRUMPT, (1932)—in a manner analogous to Rocky Mountain spotted fever, which resembles the disease closely, but the virus of which is immunologically different, as is shown by cross-immunity tests upon guinea pigs —BRUMPT, (1932). The author is the first worker to show that the dog can be successfully infected. The virus has recently been shown to live in the brains of dock rats in Marseilles. BRUMPT, (1932) has identified a rickettsia (*R. conori*) in the lesions of the experimental disease as the probable causal agent].

—J. T. EDWARDS.

I. BEDSON, S. P., & BLAND, J. O. W. (1932). **A Morphological Study of Psittacosis Virus with the Description of a Developmental Cycle.**—*Brit. J. Exp. Path.* **13.** 461-466. 2 plates. [4 refs.]

II. ELKELES, G., & GRZIMEK, B. (1932). Die Psittakose unter besonderer Berücksichtigung der veterinären Differentialdiagnose. [**Psittacosis with Special Reference to Veterinary Differential Diagnosis**].—*Tierärztl. Rdsch.* **38.** 761-765 and 847-850. [59 refs.]

I. Following intraperitoneal inoculation of virus into mice, impression smears made from the spleen showed collections of elementary bodies and also larger forms up to 1μ in diameter which were shown by staining methods to be of the same nature as elementary bodies and not cell cytoplasm. Examining mice similarly at varying periods after injection, evidence was obtained of a definite morphological developmental cycle which completed its course in between 48 and 72 hours. Tissue culture experiments duplicated this evidence, but the time taken was up to five days.

The authors suggest a similarity of the life cycle, which they describe, to that of a microsporidian and in support quote LEVADITI, NICOLAU and SCHOEN who made a rather similar statement about the virus of rabies.

II. The article gives the symptoms and lesions of psittacosis as it occurs in human beings and parrots and explains the circumstances in which a tentative diagnosis of the disease can be made. In the case of the parrot, a very important point is the exclusion of all other possible causes of disease.

There follows a list of the diseases of parrots which have been described. This list includes deficiency diseases, bacterial, virus, protozoan and fungoid infections, and worm and insect parasites.—E. J. PULLINGER.

NICOLAU, S., & LWOFF, A. (1932). Essais de culture de quelques ultra-virus en symbiosis avec des protozoaires. [**Attempts to cultivate Certain Kinds of Ultra-Virus in Symbiosis with Protozoa**].—*Bull. Soc. Path. exot.* **25.** 721-728. 7 figs. [4 refs.]

Attempts were made to cultivate the viruses of rabies, herpes and neurovaccinia in peptone-water cultures of *Strigomonas oncopelti* and *Glaucoma piriformis*. In one case—herpes cultivated with *S. oncopelti*—the culture was virulent up to the fourth subculture ; in other cases, subcultures rapidly lost virulence. Attempts to repeat the one partial success were a failure.—U. F. RICHARDSON.

DISEASES CAUSED BY METAZOAN PARASITES.

SALT, G. (1932). **The Natural Control of the Sheep Blowfly,** *Lucilia sericata,* **Meigen.**—*Bull. Entomol. Res.* **23.** 235-245. 2 figs., 3 tables. [13 refs.]

This paper is a report of a year's work on the sheep blowfly problem at the Farnham House Laboratory of the Imperial Institute of Entomology. The investigation had a twofold aim, namely, to study the reproduction of *Lucilia sericata* and the development of a satisfactory large-scale method of rearing *Alysia manducator,* a parasite which is predatory upon blowfly larvae. A detailed description of the technique adopted and a graphic representation of the reproductive activity of the female *L. sericata* is given. It is claimed that, with an ample supply of meat and suitable environmental conditions, at least one thousand progeny can be reared from a pair of *L. sericata,* which may be taken as the potential reproductive rate of the sheep blowfly.

The method of rearing *A. manducator* is described and the reproductive rate is estimated. The opinion is expressed that, although this parasite reduces to some extent the number of adult flies, it has no value as an *ultimate* controlling agent of *L. sericata.*

The report terminates with valuable suggestions concerning the blowfly problem. The author considers that the reproductive rate of *L. sericata* is such as to preclude the method of biological control ; also that the shortage of carcasses is the chief factor in limiting the blowfly population. Therefore the careful destruction of all carrion—together, perhaps, with the use of trap carcasses—would seem to be of first importance.—LL. E. W. BEVAN.

HOBSON, R. P. (1931). **Studies on the Nutrition of Blow-Fly Larvae. I. Structure and Function of the Alimentary Tract.**—*J. Exp. Biol.* **8.** 109-123. 4 figs., 3 tables. [27 refs.]

The nutrition of insects is of economic importance. An outstanding physiological problem is the role of micro-organisms in the nutrition of those insects which feed habitually on decaying matter, it having been suggested that micro-organisms either form the actual food or aid in digestion by their activities, or actually supply essential accessory substances such as vitamins. An example is the digestion of meat by blow-fly larvae, and this forms the subject of the present work.

The article contains various observations and experiments relating to the anatomy and histology of the midgut of *Lucilia sericata,* the digestive enzymes in the gut and excreta, the hydrogen-ion concentration in the alimentary tract and the process of digestion and assimilation. By combining the evidence obtained, a complete picture of the process of digestion is presented.—LL. E. W. BEVAN.

MACCHIONI, G. (1932). Le alterazioni del sangue nella distomatosi epatica degli ovini. [**The Changes in the Blood in Ovine Hepatic Distomatosis**].—*Nuova Vet.* **10.** 145-152. 3 figs. on 1 plate, 4 tables.

The author found on studying the literature that the published figures for the blood counts in cases of hepatic distomatosis varied very greatly and, further, that there were very marked divergences in the figures given by various writers as to the normal blood counts of the sheep.

He was unable to get blood from normal sheep at the slaughter-houses at Pisa because all the sheep slaughtered were affected with the parasite. His normal blood count figures are based upon the examination of the blood of animals from the Appenines in Modena.

His formula for these animals is as follows :—red corpuscles, 12,409,000 ; white corpuscles, 10,173 ; lymphocytes, 63 per cent. ; mononuclears, 4 per cent. ; intermediate forms, 3 per cent. ; neutrophiles, 28 per cent. ; eosinophiles, 2·5 per cent. and basophiles, 0·5 per cent.

Tables show the detailed blood counts of 16 sheep affected with liver fluke alone and 34 which were also suffering from verminous broncho-pneumonia.

The animals were all definitely poor in condition and presented an anaemic appearance. The average red corpuscle count fell between five and six million, but it was in some cases nearly down to three million. The corpuscles showed the usual abnormalities associated with severe anaemia.

The leucocyte formula showed no characteristic alterations, but there was in some cases a slight eosinophilia. The eosinophilia was not proportional to the severity of the infestation.—A. Leslie Sheather.

Popow, P. J. (1932). Zur Erforschungsmethodik bei der *Fasciola hepatica*. [**A Method of Experimenting on** *Fasciola hepatica*].—*Arch. wiss. prakt. Tierhlk.* **65.** 72-74. 2 figs. [3 refs.]

The author suggests that the difficulty in making observations on the action of drugs on *F. hepatica* in the liver of the host animal may be overcome by the use of the kymograph. A method of setting up the apparatus for this purpose is described and it is stated that flukes, freshly taken from the liver of an animal recently killed, register rhythmic contractions which are of a marked regularity and only decrease slowly in intensity during the following three or four hours.

—E. L. Taylor.

I. Christiansen, M. (1932). Die Muskelfinne des Rehes und deren Bandwurm (*Cysticercus* et *Taenia cervi* n. sp. *ad interim*). [**A Cysticercus in the Muscles of Deer and its Tapeworm** *Taenia cervi* **n. sp.** *ad interim*].—*Zschr. Parasitenk.* **4.** 75-100. 7 figs. [24 refs.]

II. Funck, E. (1932). Weiteres zum Vorkommen des Cysticercus inermis im Schlunde. [**An Addition to our Knowledge of** *Cysticercus inermis* **in the Oesophagus**].—*Zschr. Fleisch- u. Milchhyg.* **42.** 458.

III. Essex, H. E. (1932). **A New Larval Cestode, probably** *Hymenolepis cuneata*, **a Tapeworm of a Wild Duck.**—*J. Parasitol.* **18.** 291-293. 3 figs. [4 refs.]

I. Cysticerci obtained from the musculature of three deer were fed to dogs and the mature worms thereby obtained. Mature worms were also obtained as a result of feeding to foxes, but the growth was much slower and less certain. The morphological study of the worms revealed minor differences in the distribution of the testes and the branches of the uterus which suggested this species to be separate from *T. ovis* ; ripe segments of the worm were fed to lambs, but cysticerci did not develop, and it is concluded that the two species are distinct.

On comparison with *T. krabbei* no difference could be found. Mature segments were fed to young reindeer and evidence was obtained of the larval stage having developed in the muscles, although degeneration appeared to have speedily supervened.

As the available material of *T. krabbei* is so scanty and the descriptions are so inadequate, it is considered advisable to regard the species from the deer as new, and a new name *T. cervi* is therefore proposed.

II. *C. inermis* has been found alive in the oesophagus of cattle on five occasions during the last two years.

III. In the dissection of *Diaptomus oregonensis* the author has found

procercoids which, from the measurements of the hooks, he considers to be referable to the species *Hymenolepis* a parasite of a wild duck.—E. L. TAYLOR.

ROSS, I. Clunies. (1932). **Observations on the Resistance of Sheep to Infestation by the Stomach Worm** (*Haemonchus contortus*).—*J. Sci. & Indust. Res. Australia.* **5.** 73-80. [9 refs.]

Field observations on sheep at pasture are at variance with the experimental observations of STOLL, who described the development of an immunity to *H. contortus* in lambs after they had carried an infection for some months. Aged ewes and wethers on certain Australian farms have been observed by the author to be as heavily infested as the lambs on the same pasture. Experiments which he carried out showed however that, under conditions of artificial infection, ewes which had previously harboured many worms were more resistant than the lambs which had carried few or none.

In explanation of these conflicting observations, he suggests that the acquired immunity to *H. contortus* may be of a temporary nature, soon disappearing in the absence of reinfestation, and that the nutritional factor may be very important (as has been shown for *Ancylostoma caninum* infection in dogs by FOSTER and CORT), lambs often suffering more severely than ewes when at pasture because their nutritional requirements are more exacting and may be less completely satisfied. —E. L. TAYLOR.

MÖNNIG, H. O. (1932). **The Genus** *Agriostomum* **with a Description of** *A. cursoni* **n. sp.**—*J. S. Afric. Vet. Med. Ass.* **3.** 16-21. 6 figs. [7 refs.]

The author discusses the genus *Agriostomum* (some species of which infest domestic ruminants) and reports one or two new observations which he has made on *A. gorgonis* and *A. vryburgi.* He also describes a new species, *A. cursoni*, from the sassaby *Damaliscus lunatus*, the determination resting on minor differences, principally of size.—E. L. TAYLOR.

IMMUNITY.

DIENES, L. (1932). **Further Attempts to Transfer the Immunological Response of Tuberculous Animals.**—*J. Immunol.* **23.** 29-34. 1 table. [3 refs.]

The article describes an attempt to transfer passively the increased tuberculin response in tuberculous guinea pigs which have received an injection of egg white. Some irregular positive results were obtained, but in view of the complexity of tuberculin reactions of this nature, no definite conclusions are drawn. The extension of these experiments to other species of animals is suggested.—R. E. GLOVER.

PARKER, F. Jr., JACKSON, H. Jr., FITZHUGH, G., & SPIES, T. D. (1932). **Studies of Diseases of the Lymphoid and Myeloid Tissues. IV. Skin Reactions to Human and Avian Tuberculin.**—*J. Immunol.* **22.** 277-282. 2 tables. [7 refs.]

Tuberculin tests, using both human and avian tuberculins, have been performed on patients with Hodgkin's disease, malignant lymphoma, leucaemia, pernicious anaemia, malignancy and tuberculosis. Normal individuals were also tested. When negative results were obtained the test was repeated with a more concentrated tuberculin. The greatest percentage of positive reactions was given by apparently normal or tuberculous patients, but in patients with disease of the lymphoid or myeloid tissues more positives were obtained with avian than with human tuberculin.—NORMAN HOLE.

TRENSZ, F. (1932). La " serofloculation palustre " de Henry dans la trypanosomiase caméline et la leishmaniose canine expérimentales. [**" Malaria Sero-Flocculation " Reaction (Henry) in Experimental Infections with Camel Trypanosomes and Canine Leishmania**].—*Bull. Soc. Path. exot.* **25.** 230-234. 1 chart. [1 ref.]

HENRY's hypothesis is that antibodies are of two kinds, depending upon the nature of the antigens, which he describes as exo-antigens derived from the exterior and endo-antigens which are produced within the organisms. As examples of endo-antigens, the pigments produced by malaria parasites are given. HENRY considers that the endo-antigens can cause the development of flocculating properties in the sera of infected persons.

As it is difficult to get malaria pigment, salts of iron were used as " substitute antigens." No positive reactions have been obtained with normal subjects, but it has been found possible to diagnose malaria by means of the test in infected persons even during afebrile periods.

In this paper Trensz records experiments in the detection of infections caused by protozoa which produce no pigment. A strain of *T. berberum* in guinea pigs was used, and tests were carried out every eight to ten days. Positive results were obtained after an interval ranging from 19 to 75 days after inoculation. At first the reactions were weak, but they became progressively more marked and finally in 50 per cent. of cases " massive " reactions were given. Control guinea pigs invariably gave negative results.

Salts of iron and choroid melanin were used, but no details of the tests are given. Albuminate of iron and melanin were used to test two dogs inoculated with canine leishmaniasis and positive results were obtained.—A. LESLIE SHEATHER.

ARLOING, F., DUFOURT, A., & MARTIN, P. E. (1932). Variations du pouvoir vaccinant des protéines microbiennes suivant leur état de dégradation. [**Variation in the Vaccinating Power of Microbial Proteins according to the Extent to which they are broken down**].—*C. R. Soc. Biol. Paris.* **111.** 803-805.

The protein derivatives of pneumococcus and *Bact. coli* are capable of inducing a degree of protective power when inoculated into guinea pigs. Apparently the constituent proteins have a similar antigenic effect to that of the whole organisms, but this effect becomes progressively less as the molecule gets smaller, the action of the amino-acids being barely detectable.—NORMAN HOLE.

MCBRYDE, C. N. (1932). **Anemia in Relation to Vaccination Shock in Young Pigs.**—*J. Amer. Vet. Med. Ass.* **81.** 582-599. 4 tables. [9 refs.]

" So-called vaccination shock is a more or less severe reaction which occurs in young pigs following the injection of anti-hog cholera serum and is a phenomenon or occurrence that seems to have attracted attention only within the past few years."

The author gives the following brief review of existing knowledge on the subject :—

Vaccination shock is confined chiefly to young pigs weighing less than 40 lb. and appears to be associated with the injection of clear heated serum. The shocks occur more frequently and more severely following intraperitoneal injection than after subcutaneous injection. Increasing attention is being paid to anaemia in young pigs and the three principal factors generally assumed to be involved in its causation are :—lack of sunshine, lack of exercise and want of contact with soil or mineral matter.

McBryde carried out a series of haemoglobin determinations on young pigs using the original Tallquist scale. The pigs were then inoculated by the serum-virus method against swine fever using clear heated serum. He showed that there was a definite correlation between the haemoglobin content of the blood and the degree of shock, the shock increasing in severity as the anaemia became more pronounced.

Two comparative experiments were carried out to determine the influence of earth and of concrete floors on the health of young pigs. It was found that the haemoglobin content of the pigs on concrete was considerably lower than in those on the earth floors and that their appearance and growth was considerably inferior.

McBryde believes that anaemia is an important factor in the causation of vaccination shock and that it is induced by insufficient sunshine and exercise and want of contact with the soil.

Under conditions where it is imperative that young anaemic pigs should be immediately immunized, he recommends the use of whole blood serum [presumably whole blood].—T. M. Doyle.

DISEASES, GENERAL.

Danelius, G. (1932). Från en studieresa i U.S.A. Sterilitet hos Sto. **[Studies made on a Study Tour in the United States. Sterility in Mares]**.—*Svensk Vet.-tidskr.* **37.** 131-140 and 174-178.

During 1930 the author visited America's chief horse breeding district in Kentucky and he gives a report on sterility in mares.

At the Kentucky Agricultural Experiment Station prophylaxis is considered to be of the utmost importance in controlling sterility and, by means of a permanent annual working plan, an effort is made to protect the sexual health of the whole breeding stock. The mare in foal is particularly well cared for and the foaling takes place in sanitary boxes. The mare is examined before being brought to the stallion and, if any defect is discovered, it is not served but is treated until the next heat period or longer. All brood mares are examined when the breeding season is over, pregnant mares are vaccinated against *Bact. abortus equi* and barren mares are classified and treated. Strict cleanliness is observed at service and the semen from stallions is examined several times during the season.

In the course of examining the sexual organs the results of cultural tests of the mucous membrane of the cervix uteri are considered to be of the utmost importance.

In a third of all barren mares there is usually a slight or severe cervicitis and metritis. *Streptococcus genitalium* is found in 25 per cent., *Encapsulatus genitalium* in 5 per cent. and mixed infection in 3·5 per cent. of such mares. *Str. genitalium* causes severe cervicitis and metritis in mares, usually resulting in sterility, abortion or the birth of weak offspring. Streptococci have also been found in the semen in stallions and the stallion is then considered to be infective. Treatment of the ovaries of infected mares has not usually given good results and therefore the main treatment is applied to the uterus. Different solutions of weak concentration are used for the local treatment of the uterus and its secretion is examined bacteriologically. Affected mares are not bred until the catarrh of the uterus is quite cured.—N. Lagerlöf (Stockholm).

Velu. (1932). Les maladies du Bétail au Maroc. **[The Livestock Diseases of Morocco.]**.—*Rec. Méd. vét. exot.* **5.** 91-95.

This is a review of the more important diseases of domestic mammals in Morocco. The chief diseases controlled by vaccination include anthrax, blackleg, pasteurellosis, tuberculosis, infection with the bacillus of Preisz-Nocard, paratyphoid infections in young pigs, sheep pox and rabies. Antisera are used against sheep pox, swine fever and anaerobic infections. Epizootic lymphangitis is said to be curable by mercury biniodide and [contagious] agalaxia of goats by stovarsol.

Trypanosomiasis and piroplasmosis are of some importance in Morocco. " Piroblue " is useful against the latter and " Fourneau 309 " against dourine and " debab ".

Both external and internal (worm) parasites are common : sodium arsenite baths are efficient against the former and internal medication combined with measures to break the parasitic life cycle (crop rotation, chemical top dressing of pastures, water, etc.) are indicated against the latter.

Nutritional diseases are largely due to vagaries in climate and weather and may be represented by all stages of under-nourishment or by plant poisoning (lack of proper herbage). Relative malnutrition (précarences) which may be represented by a definite avitaminosis, or merely by failure to thrive, is important.—J. E.

ROUX. (1932). Les maladies du Bétail en Syrie. [**The Livestock Diseases of Syria**].—*Rec. Méd. vét. exot.* **5.** 96-99.

It is gathered from the original that the following diseases are the most important :—rinderpest, anthrax, rabies, camel mange, poultry diseases, helminthiasis (cysticercosis, fluke, strongyle and echinococcus infestation). These are all widespread. Less important diseases are glanders, dourine, blackleg, sheep and goat mange, pleuro-pneumonia in goats, ovine pasteurellosis, equine piroplasmosis and " el-debab " (camel trypanosomiasis). Foot and mouth disease, tuberculosis, sheep pox and epizootic lymphangitis are rare. Diseases of swine are also rare, due to the small number of swine in Syria.—J. E.

CURASSON. (1932). Les maladies du Bétail au Soudan français. [**The Livestock Diseases of the French Sudan**].—*Rec. Med. vét. exot.* **5.** 100-110.

RINDERPEST.—The epidemiology of this disease during the last 15 years is described. Great variation has been observed. Indirect transmission plays a small part in the spread of rinderpest. With regard to control, there are two orders defining suitable measures to prevent the spread of infection. The author states, however, that these are very difficult to apply in his territory and recommends vaccination as the most practicable method available. His formolized organ vaccine has now been used with favourable results on fairly large numbers of animals.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—This disease seems to have flared up somewhat in the last two years. The author's formolized lymph is the most promising weapon for control, but it requires further testing on a large scale before its true value can be ascertained. Neosalvarsan is said to be of curative value. [Its effect on encapsulated lung lesions is not stated].

TRYPANOSOMIASIS.—Trypanosome infections of the large domestic animals are of great economic importance, but they only prevent stock raising entirely in a few small areas. *Trypanosoma cazalboui* [*vivax*] causes serious losses in horses and reduces their longevity. *T. soudanense* is of secondary importance in horses. Cattle and camels suffer from various chronic trypanosome infections, but sheep are relatively resistant.

Although swine are scarce in the French Sudan, two dissimilar outbreaks of disease causing a high mortality in two herds of pigs were diagnosed as a trypano-

some infection, one of which was identified as *T. brucei* (chronic course).

PIROPLASMOSIS.—This disease is rare. *Babesia bigemina* and *Theileria mutans* have been found in cattle.

ANTHRAX, TUBERCULOSIS, HAEMORRHAGIC SEPTICAEMIA and FOOT AND MOUTH DISEASE.—These are known, but cause slight trouble only.

" HEARTWATER."—This was definitely diagnosed by Curasson in 1922 and causes rather severe losses in sheep flocks. Some tests of the virus are described in the article. *Amblyomma* ticks exist in the affected regions, but no actual evidence of their significance as transmitters has been found locally : it is assumed that they are involved in this respect.

" BLUE TONGUE."—This disease was introduced in 1923 from South Africa in imported merinos and spread to indigenous sheep, in which it takes a mild course.

SHEEP POX.—This has been known for some time and affects indigenous wool sheep in a mild manner. A native method of vaccination is employed by flock owners.

ECTHYMA CONTAGIOSA.—This is also of minor importance and is treated by a native method of vaccination.

PYOGENIC INFECTION OF SHEEP AND GOATS.—A pyogenic infection is common and difficult to eliminate ; the Preisz-Nocard bacillus has never been demonstrated in association, but an unidentified coccus is commonly found.

EPIZOOTIC LYMPHANGITIS.—This disease is widespread, but does not cause serious loss. Mercury biniodide is said to have given the best curative results.

MANGE.—Horses are rarely affected, but cattle frequently suffer from symbiotic mange which affects the tail and rump region. Sarcoptic mange in sheep is also widespread. Psoroptic mange (sheep scab) evidently entered the French Sudan on imported sheep from Algeria.

HELMINTHIASIS.—Cysticercosis is very common in cattle, and in sheep verminous gastro-enteritis, distomatosis and oesophagostomiasis are most important.

FOWL DISEASES.—Spirillosis causes serious loss ; fowl pox is less important.

—J. E.

PRUNIER. (1932). Les maladies du Bétail en A.O.F. (Sénégal-Mauritanie). [**The Livestock Diseases of French West Africa (Senegal and Mauritania)**].—*Rec. Méd. vét. exot.* **5.** 110.

This is a two-line note referring the reader to an earlier article [(1930). *Rec. Méd. vét. exot.* **3.** 176].

[The latter concerns the incidence of rinderpest and the proposed methods of control, which include the use of vaccination, sero-vaccination and serum immunization. Curasson's formolized vaccine (since favourably reported upon) was recommended].—J. E.

AILLERIE. (1932). Les maladies du Bétail à la Côte-d'Ivoire. [**The Livestock Diseases of the Ivory Coast**].—*Rec. Méd. vét. exot.* **5.** 110-112.

In order to prevent the introduction of rinderpest and contagious bovine pleuro-pneumonia, all cattle must pass through control areas at the frontier. There are eight of these areas under the supervision of a trained native. In an outbreak of rinderpest, vaccines, virus in bile or antiserum are employed. Formolized vaccine is used against pleuro-pneumonia.

Anthrax is controlled by intradermal vaccination. Sarcoptic mange in sheep, goats and dogs, symbiotic mange in goats and follicular mange in dogs are widespread.

Foot and mouth disease has been observed only once, in 1928. Trypanosomiasis hinders stock raising in some parts. Information on tsetse fly and trypanosomiasis on the Ivory Coast was described in *Rec. Méd. vét. exot.* **3.** 28. East Coast fever is prevalent, " heartwater " is common and is controlled by tick destruction and injections of camphorated and caffeined [? normal] serum. Pasteurellosis affects all the common livestock. Canine distemper is usually of the nervous type. The common poultry diseases of other parts also exist on the ivory coast and helminthiasis is also common.—J. E.

NOUVAL. (1932). Les maladies du Bétail à la Guadeloupe. [**The Livestock Diseases of Guadeloupe**].—*Rec. Méd. vét. exot.* **5.** 112-115.

Glanders and farcy used to be prevalent in the early years of this century, but they have now been eradicated. Epizootic lymphangitis is still common and is treated curatively by various means, surgical, local and general chemotherapy, etc. " Farcin du boeuf," caused by the streptothrix isolated by NOCARD is common : no reliable method of treatment has yet been found. Bovine tuberculosis is very rare ; swine fever is common. Reference is also made to two other bovine diseases of obscure identity—a chronic diarrhoea with a serious mortality rate and a disease called " Folie du boeuf ".—J. E.

RUBAY, M. (1932). A propos du brouillard observé dans la vallée de la Meuse en décembre 1930 et de ses effets nocifs chez les animaux. [**The Fog observed in the Meuse Valley in December 1930 and its Harmful Effects on Animals**].—*Ann. Méd. vét.* **77.** 97-110 and 145-158.

RUBAY, M. (1932). Au sujet des accidents produits par le brouillard dans la région de la Meuse. [**Accidents caused by the Fog in the Meuse District**].—*Ibid.* 390-391.

The author was appointed to investigate the injury sustained by cattle in the three-days' fog which occurred in December, 1930. He visited the place 10 days and 15 days after the fog, examined many convalescent cattle and made a *post-mortem* examination of two cows which had not recovered and were *in extremis.* Cattle situated in the affected area showed difficulty in respiration, cyanosis and early death followed from asphyxia. They also showed pulmonary and subcutaneous emphysema and tympanites. To reduce the losses, all cattle were moved after the onset of the fog to high land out of the affected area and by this method most were saved.

The author deals in detail with the pathogenesis of the pulmonary and subcutaneous emphysema and concludes that the chemical excretions of the heavy industrial works in the valley became concentrated in the foggy air to a degree sufficient to injure the mucous membrane of the alveoli of the lungs. Compounds of sulphur were mostly blamed. The lethal cause was twofold — an initial inflammation of the pulmonary mucosa followed by oedema and the loss of much effective respiratory surface in the lungs leading to hypoventilation of the blood. [See also this *Bulletin.* **1.** 176 and 254].—J. E.

DOYLE, L. P. (1932). **A Disease affecting the Legs of Cattle.**—*J. Amer. Vet. Med. Ass.* **81.** 256-258. 2 figs. [1 ref.]

In the autumn of 1931 a hitherto unknown disease of cattle appeared in Indiana ; this took the form of an inflammatory swelling of one or both forelegs of cattle living over a wide area ; the swelling started near the foot and extended upwards. The condition was a lymphangitis extending visibly sometimes to the prescapular lymph gland.

Biting flies were prevalent and appeared to be associated with the outbreak, but no evidence of the manner in which they were responsible is offered.—J. E.

PILLERS, A. W. N. (1932). **Some Reflections on Itchy Legs of Cart Horses.—A Clinical Study.**—*Vet. Rec.* **12.** 969-976. [3 refs. in text].

Infestation of the legs of cart horses with *Chorioptes equi* is a condition to which scant attention is usually paid. The author, on the other hand, regards it as a prime factor in the production of inefficiency and a shortened working life. Wounds, capped elbows, concussed limbs, fractures and damage to shoes and stables are cited as among the immediate consequences. The end results of neglect or failure to recognize the condition are deemed of even greater importance. The prolonged irritation caused by the parasites is considered responsible for failure to lie down, unthriftiness and many forms of chronic lameness. Abrasions of the skin may lead to local infection which may culminate in lymphangitis and elephantiasis. Toxaemia and remote metastases may occur.

Repeated damage to the integument leads to the formation of H substance with consequent increased adrenal output, high blood pressure and irritability of temper. Affected animals may, therefore, become difficult to groom or shoe and may inflict injuries on attendants and farriers. The part played by the farrier's apron as a lesser factor in transmitting the disease is referred to, as is also the fact that the infestation frequently becomes exacerbated when horses are turned out to grass. The control and treatment of the disease are discussed fully. The occurrence, to some extent, in the lighter breeds of horses which suffer rarely from itchy legs, of the same injuries and diseases associated by the author with chorioptic infestation in cart horses, is admitted.—A. A. PRYER.

AUBLIN, J. B. (1932). Leucocytoses du Cheval. [**Leucocytoses of the Horse**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 90. 5 figs. [62 refs.]

This thesis commences by dealing with the normal leucocyte counts, both total and differential, of horses and the influence thereon of such factors as sex, age, fatigue and hunger. The author concludes that the total count and also the proportion of polynuclears are higher in stallions than in mares and geldings, and also in old debilitated horses than in those in good condition and in their prime. Variations consequent on the time of day and the taking of food are slight.

The author next records his findings in respect of the pathological leucocytoses encountered in such varied conditions as suppuration, osteomyelitis, tumours, influenza, pneumonia and infectious anaemia. Thirdly, the question of intensifying natural leucocytosis, as a therapeutic measure in many diseases, is discussed at length. In order to provoke such an induced leucocytosis, a variety of agents were injected, amongst them being the nucleinates of soda and lithium, leucocytic extracts, protein substances such as broth, milk and blood serum, oil of turpentine and tapioca. A leucocytosis, mainly polynuclear in character, but varying in intensity with the agent employed, followed in nearly all cases. Most of the substances injected gave rise to a local reaction of short duration, but fever was usually absent. The blood examinations were carried out by standard methods.
—A. A. PRYER.

PURDY, W. J. (1932). **The Propagation of the Rous Sarcoma No. 1 in Ducklings.**—*Brit. J. Exp. Path.* **13.** 473-479. 1 chart. [4 refs.]

The Rous sarcoma No. 1 has been propagated in very young Khaki Campbell ducklings for five tumour generations and the author considers that, presumably, it could be propagated indefinitely in these birds.

Minced tumour tissue was used as the inoculum, 0·5 c.c. being inoculated intramuscularly. Within the species it is propagative by means of cell grafts, but filtrates do not produce tumours. Filtrates of duck-grown Rous sarcoma give rise to tumours in fowls, an alien species, and thus demonstrate a filter passing agent.—NORMAN DOBSON.

REINUS, B. (1932). Ueber Eileiterzysten des Geflügels. [**Cysts of the Oviducts in Poultry**].—*Berl. tierärztl. Wschr.* **48.** 225-228. 3 figs. [39 refs.]

In 482 *post-mortem* examinations carried out on poultry, 8·29 per cent. showed cysts in the peritoneal sac, mostly in the neighbourhood of the cloaca. Histologically the cyst walls showed great similarity to the mucous membrane of the oviduct.—J. R. M. INNES.

KERR, W. R. (1932). **Poultry Disease Experimental Work.**—*Harper Adams Util. Poultry J.* **17.** 534-538.

A description is given of the bacillary white diarrhoea scheme of the Animal Diseases Division, Ministry of Agriculture, Northern Ireland. Dealing with fowl paralysis, it is stated that a new strain of poultry may be introduced on to a farm where the disease exists and the newcomers apparently remain immune even when they have access to the same ground. Interbreeding between the new strain and the old must not take place. Where this has been known to occur the progeny have become affected.—NORMAN DOBSON.

I. MANLEY, F. H. (1932). **Fowl Paralysis in Cyprus.**—*Vet. J.* **88.** 243-247. [5 refs.]

II. BAYON, H. P. (1932). **The Pathogenesis of** *Neuro-lymphomatosis gallinarum* **and Similar Forms of "Fowl Paralysis."**—*Vet. Rec.* **12.** 457-467. 8 figs. [22 refs.]

I. A condition is described by the writer which he considers closely resembles specific fowl paralysis. He states that *post-mortem* examination failed to disclose the usual lesions which are now regarded as diagnostic of fowl paralysis.

[He describes symptoms which, one might suggest, may have been due to coccidial infection, but he states that no coccidia were present. This of course does not prevent the condition being due to this cause. Fowl No. 7 at *post-mortem* examination revealed a considerable amount of enteritis throughout the intestines, but under the histological details of the case the intestine is not even mentioned. Four out of 15 infected birds are said to have made an apparently complete recovery.]

II. The association of coccidiosis and fowl paralysis is discussed. It is stated, regarding some pullets suffering from coccidiosis, that many birds are anaemic and show leg weakness or flaccid paresis, that they are limp and crouch in corners, etc. The author considers that these symptoms and signs after death should be distinguishable from those occurring in neurolymphomatosis. The deciding factor is by microscopic examination as the lesions which may occur in peripheral nerves in coccidiosis are definitely inferior in intensity to those pathognomonic of neurolymphomatosis. *Davainea proglottina*, he considers, may act as an inciting cause of paralysis. The value of vitamins A, B, C, D and E in the diet of poultry is discussed.

The author suggests that neurolymphomatosis is the result of cumulative causes among which lack of green food at an early age induces alterations in the vessels of the central and peripheral nervous systems. Later a proliferation of lymphoidal cells localize in the nerves and cause paralysis. Eighteen out of 33 fowls have been cured of severe neurolymphomatosis by feeding with lettuce or

water cress. Even where neurolymphomatosis has developed in a strain, notwithstanding the presence of wholesome green food, the mortality due to paralysis does not rise above from 5 to 7 per cent.—NORMAN DOBSON.

I. BLOUNT, W. P. (1932). **Studies of Fowl Paralysis. III. Gastronomic Enteritis.**—*Vet. J.* **88.** 236-240. 1 table. [2 refs.]
II. BLOUNT, W. P. (1932). **Vitamin B and Fowl Paralysis.**—*Ibid.* 289-299. 3 tables. [28 refs.]
III. BLOUNT, W. P. (1932). **The Clinical Diagnosis of Leg Paralysis in Fowls.**—*Vet. Rec.* **12.** 660-662. [7 refs.]

I. From a questionnaire, the author finds that 90 per cent. of the cases of paralysis investigated have occurred on farms where either no grit or soluble grit has been used and he considers that this condition is associated with incorrect attention to the requirements of the gizzard of chicks during the intensive brooding period. Where birds are reared semi-intensively and become affected, he finds that the type of soil or general conditions have been such as would be unlikely to supply a number of growing birds with adequate quantities of grit. Most of the outbreaks have been complicated by an intestinal parasitosis, but the birds receiving flint grit failed to exhibit such parasitic infestation.

II. The author, working upon the belief that an imbalance of vitamins can cause harm, states that many popular rations contain a considerable excess of vitamin B_1 for growing chicks and that to deprive them of their supply of vitamin C is to cause such an imbalance. He suggests that this may be related to fowl paralysis.

Cereal by-products which have a concentrated content of vitamin B_1 are largely used for poultry and Blount suggests that the birds are suffering from hypervitaminosis B_1 which is aggravated by the custom of adding to the diet yeast, a substance rich in this vitamin.

III. Details are quoted of the nerve supply to the leg. In advanced cases, when there is complete paralysis of the " extensor " muscles, the opposing " flexor " muscles draw the toes backward in the form of a claw. Other workers have noted this condition. The author states that he can differentiate between fowl paralysis and paresis due primarily to coccidiosis by holding the bird by the wings near the base and watching the position of the legs. If the bird is lowered rapidly towards the ground a natural reflex should be seen, an extension of the hock joint with a well marked extension of the digits. This spreading out of the toes in a fan shape is absent in a great many cases of fowl paralysis, but still persists in cases of paresis due primarily to coccidial infection.—NORMAN DOBSON.

RIDALA, V. (1932). Kanade leukemia. [**Fowl Leucaemia**].—*Eesti Loomaarst. Ring.* **8.** 70-81 and 99-114. 2 plates, 1 table. [56 refs.] [Abst. from German summary].

This paper contains a review of the literature of fowl leucaemia and describes fully its incidence in Esthonia during the last 10 years. According to the results of diagnostic work carried out at Tartu University, leucaemia is more common than avian tuberculosis in that country.

Five cases of " aleucaemic lymphatic leucaemia " in fowls are described in detail and the pathology of the condition is discussed.

The author believes that the cause of the disease is not a filtrable virus, but some non-specific stimulus affecting the haemopoietic system.—J. E.

DUNLAP, G. L. (1932). **An Ataxia of Chicks Associated with Nephritis.**—

J. Amer. Vet. Med. Ass. **80.** 880-885. 1 fig., 2 tables, 2 photomicrographs. [7 refs.]

A study of a disease locally known in Massachusetts as " crazy chicks." Symptoms are generally observed at 20 to 23 days old, but not after 35 days. Mortality averages 5 per cent. but in individual flocks may reach 50 per cent. Incidence is much higher in males and is obscurely influenced by slight changes in management.

Macroscopic changes are nephritis and proventriculitis. Microscopic changes are cloudy swelling and interstitial haemorrhages of the kidneys, and separation of glandular epithelium from the basement membrane of the proventriculus.

Blood data are presented for uric acid, non-protein nitrogen and glucose, the uric acid being shown as from two to six times the normal figure.

The author considers that the histological and blood findings indicate " impairment of nitrogenous metabolism " and that the exciting cause is high protein intake combined with forced feeding and rapid growth. [If this is correct the disease should be easily reproducible for final physiological elucidation].

—H. H. Green.

Hall, G. N. (1932). **Polyneuritis in Fowls ; A Note on the Occurrence of the Disease in Northern Nigeria.**—*Vet. J.* **88.** 337-340. 2 figs. on 1 plate. [4 refs.]

A brief description of two cases of fowl paralysis associated with polyneuritis. No new facts are added to the literature apart from recording the disease as occurring in Nigeria.—J. R. M. Innes.

Titus, H. W. (1932). **Perosis, or Deforming Leg Weakness, in the Chicken.** —*Poultry Sci.* **11.** 117-125. 4 tables. [10 refs.]

Discusses a disease of young chickens reared in confinement, manifested first as tendency to rest in the squatting position, later by " enlarged hocks " with small haemorrhages in the underlying tissues, and finally by gross deformity of the tarso-metatarsi and tibiae sometimes passing over into " slipped tendon."

The author believes that an improper calcium-phosphorus ratio and a thermolabile vitamin B fraction are causally implicated. Cod liver oil did not prevent the disease but rice bran decreased its incidence.

Blood analysis revealed little. Composition of a perosis-producing diet is recorded.

[Conclusions leave the impression that non-nutritional causes also need investigation].—H. H. Green.

I. Hughes, T. A., Shrivastava, D. L., & Malik, K. S. (1932). **A Note on the Blood Cholesterol in Osteomalacia.**—*Ind. J. Med. Res.* **19.** 1205-1208. 1 table. [10 refs.]

II. Gardner, J. A. (1932). **Cholesterol Metabolism in Disease.**—*Brit. Med. J.* Aug. 27th. 392-396. 3 tables.

III. Aschoff, L. (1932). **Observations concerning the Relationship between Cholesterol Metabolism and Vascular Disease.**—*Ibid.* Dec. 24th. 1131-1134.

I. The occurrence of low plasma cholesterol in some cases of human osteomalacia is confirmed. In three cases treated with vitamins A and D and calcium glycerophosphate, the improvement in clinical condition was associated with a rise in cholesterol roughly parallel to the rise in inorganic phosphorus. Although the full significance of the low blood cholesterol is not clear it is assumed to be associated with the deficiency of vitamin D.

[It would be of interest to know what relation blood cholesterol bears to blood phosphorus in South African bovine osteomalacia—an aphosphorosis in which the D factor is not regarded as significant].

II. A general article discussing the relationship of cholesterol to bile acids and cognate compounds, the hepatic-intestinal circulation of cholesterol, the failure to utilize phytosterol, cholesterol deposition in tissues, alimentary hypercholesterolaemia, cholesterol metabolism during pregnancy, blood cholesterol in biliary and hepatic disease, in nephritis (very high in cases which possess the " nephrotic " syndrome) and in myxodema (often 50 per cent. above normal).

III. A paper discussing the fatty changes in the intima of vessels, atheroma as a " cholesterol steatitis," the mechanism of lipoid deposition, the influence of age, the pathology of necrotic changes, calcification of the media, general causative factors and mechanical factors. In reviewing the whole picture of the development of atheroma the author concludes that the precipitation of lipoids is the important factor and that enquiries into the nature of the condition are intimately concerned with problems of cholesterol metabolism.—H. H. Green.

I. —. (1932). **Bush Sickness. Investigations concerning the Occurrence and Cause of Bush Sickness in New Zealand.**—*New Zealand Dept. Sci. & Indust. Res. Bull.* No. 32. pp. 62. 30 figs., 13 tables, 1 map. [40 refs.]

II. Becker, R. B., Neal, W. M., & Shealy, A. L. (1931). **I. Salt Sick : its Cause and Prevention. II. Mineral Supplements for Cattle.**—*Univ. Florida Agric. Exp. Sta. Bull.* No. 231. pp. 23. 13 figs., 3 tables. [19 refs.]

I. This is an extensive paper divided into three parts :—

(1) " The Occurrence of Bush Sickness at Glenhope, Nelson, New Zealand " by H. O. Askew and T. Rigg of the Cawthron Institute.

(2) " The Occurrence of Bush Sickness on the Volcanic Soils of the North Island," (a) " The Distribution and Field Characteristics of Bush-sick Soils," by L. I. Grange and N. H. Taylor of the New Zealand Geological Survey, and (b) " The Mechanical and Chemical Characteristics of Bush-sick Soils," by T. Rigg and L. Hodgson.

(3) " Soil Iron in Relation to the Incidence of Bush Sickness," by T. Rigg and H. O. Askew.

For the numerous tabulated data the original must be consulted, but attention may be drawn to the following points :—

(a) A map of the central part of North Island, showing the soil-forming ash showers of past volcanic outbursts is provided, and photographic reproductions are given to illustrate the general topography of the country and the various soil profiles discussed. Adequate references to literature are given as foot-notes to the text.

(b) The authors agree with the iron deficiency theory [see Aston. this *Bulletin*. **3.** 40.], mainly on the grounds that the disease is an anaemia which responds to treatment with iron compounds. It is also suggested that Mairoa " dopiness " [compare this *Bulletin*. **3.** 41.] may also be due to iron deficiency.

(c) The actual difference in iron content of soil and vegetation on affected and unaffected areas was often not so great as would be expected, but extraction of " available iron " by 5 per cent. oxalic acid revealed distinct differences between bush-sick and healthy soils.

(d) The hypothesis of soil contamination of pasture grass is developed to explain the health of animals on certain apparently iron-deficient pastures. On the basis of 0·4 per cent. contamination of green pasture it is shown that a large

proportion of the iron requirements of grazing animals may be met on certain soil types.

II. The first part of this paper deals with " salt sick " of Florida [see previous mention, this *Bulletin*. **3.** 40.] a long-known but only recently defined disorder which constitutes the greatest single loss to the cattle industry of the state. It is now described as a nutritional anaemia due to iron deficiency [technical protocols to follow in a later publication] and is controlled by administration of iron compounds supplemented with copper. A common preventive lick consists of 100 lb. salt, 25 lb. red oxide of iron and 1 lb. of copper sulphate, offered in boxes with ordinary salt in neighbouring boxes so that animals have free choice. For more advanced cases two to three ounces of a solution containing ½ lb. of ferric ammonium citrate and 2·25 g. of copper sulphate in one gallon of water, may be given as a drench or in the drinking water. Photographic reproductions of " salt sick " and cured cattle are given, fig. 4 showing an advanced case in which haemoglobin was only one-third of normal.

Part 2 of the paper is general and discusses possible shortage of other mineral elements in Florida.—H. H. Green.

PUBLIC HEALTH.

Verge, J., & Thieulin, G. (1932). Recherches sur l'inspection bactériologique des viandes. La mise en évidence des bacilles carnés chez le porc. [**Bacteriological Examination of Meat. Evidence of Food Poisoning Bacteria in Pork**].—*Rev. gén. Méd. vét.* **41.** 1-11. 2 tables. [22 refs.]

Certain members of the salmonella or paratyphoid group are pathogenic for man only, certain for animals only, whilst others such as *Bact. aertrycke*, *Bact. enteritidis* [Gaertner's bacillus] and *Bact. suipestifer* may cause gastro-enteritis in man and may also be found in the flesh of food animals. Only bacteriological examination is capable of revealing the presence of such bacteria in meat. The authors comment on the difficulties involved in rapid bacteriological examination and advocate cultivation, from the bone marrow of suspected carcasses, direct on to agar having a pH value of 7·4 and to which brilliant green in a final concentration of 1 : 50,000 is added. They claim that, after 24 hours incubation on this medium, members of the typhoid-paratyphoid group grow to the exclusion of all others with the exception of *Pseudomonas pyocyanea* and *Ps. fluorescens*. The typhoid-paratyphoid colonies vary in colour from green to greenish-yellow. A table is given showing the results of this method applied to samples from 20 pigs, presumably from suspected carcasses. In the only four cases in which a growth on this media was obtained, it proved to be a culture of the typhoid-paratyphoid group which by direct agglutination would appear in each case to be *Bact. suipestifer*.
—R. Lovell.

Standfuss, R., & Schünke, P. (1932). Die Milzschwellung des Rindes mit besonderer Berücksichtigung der Fleischbeschau. [**Swelling of the Spleen in Cattle and its Significance in Meat Inspection**].—*Zschr. Infektkr. Haust.* **42.** 209-219. [27 refs.]

This is a useful work for meat inspectors and deals systematically with the various types of enlarged spleen seen in slaughtered cattle. The author first describes the normal spleen and then discusses the abnormal conditions under three headings :—fresh inflammatory swelling, chronic swelling and a third type he speaks of as " gelatinous swelling." The pathogenesis of these types is discussed.
—J. E.

LACHENSCHMID, B. (1932). Die Verfärbung des Fleisches nach Trypanblau-injektionen. [**The Discolouration of Meat after Trypan Blue Injections**].—*Münch. tierärztl. Wschr.* **83.** 269-271. [20 refs.]

After a summary of the literature on the subject, the author discusses several cases observed in Munich and points out that the Meat Regulations do not take such cases into consideration. He suggests, however, that trypan blue injections should not be used on cattle that are likely to be slaughtered within a few months and asks for the observations of other veterinarians as to the length of time the colouring matter remains in the tissues.—F. BULLOCK.

BERRY, A. E. (1932). **Inspection of Milk Pasteurizing Plants.**—*Canad. Publ. Health J.* **23.** 37-41. 2 figs.

This is a plea for the careful inspection of pasteurizing plants, the complexity of which calls for special supervision to see that pasteurization is effectively carried out. Inspection should involve all points which may effect the final products.

The points which require special attention are the process, the plant layout, piping arrangements, inlet and outlet valves, cold pockets, foam formation, recording thermometers, bottlers, cappers, cleansing of utensils and health of personnel. The most common defects are connected with inlet valves on the pasteurizer, cold pockets on the outlets, outlets, foam formation in the milk and the accuracy of the thermometers.

The author concludes by saying " The objective of every plant should be well designed equipment properly operated by healthy workmen. With this combination it can be truly said ' Safe Milk is pasteurized '."—D. S. RABAGLIATI.

I. ROBERTSON, I. S. (1932). **The Milk Problem : The Production and Distribution of Milk.**—*Trans. Roy. Sanit. Ass. Scotland.* pp. 87-95.

II. MACGREGOR, A. S. M. (1932). **The Milk Problem : The Transmission of Infection by Milk and its Prevention.**—*Ibid.* pp. 96-102.

III. TROTTER, A. M. (1932). **The Milk Problem : Rational Methods of Milk Control.**—*Ibid.* pp. 103-114.

IV. BISHOP, T. (1932). **The Milk Problem : Administration.**—*Ibid.* pp. 115-152. 3 tables.

I. The writer of this paper wisely points out that " a good dairy cow is made or marred in the first few months of her life." He emphasizes the need for rational and hygienic methods of calf-rearing and discusses the feeding of dairy cows, methods of milking and the utility of milk-recording. He pleads for the simplification of the present grades of milk and is much against " the appeal to the cow " and the 3 per cent. butter fat standard.

II. The author, who is Medical Officer of Health for the city of Glasgow, chiefly deals with tuberculosis and the milk supply, giving all the usual arguments of those who are in favour of pasteurization. He urges that legal steps should be taken to give permissive powers to the large urban areas to require efficient pasteurization (or other accepted form of heat treatment) of all milk sold within their area which is not drawn from tuberculosis-free cows.

III. The essayist, who is Chief Veterinary Officer to the city of Glasgow, points out the dangers of our present day milk supply and enumerates the so far inadequate measures taken—past and present— to reduce the extent of tuberculosis in cattle. He affirms that there are many parts of Scotland, especially in the Highlands, particularly well adapted for the rearing of stock and urges that more use should be made of these for the breeding of tuberculosis-free cattle.

IV. The essayist asks the question : " Are we getting clean milk ? " He

then briefly describes the methods taken in Scotland to procure a clean milk supply. He states that out of approximately 446,000 milk cows in Scotland only 3,081 are on "Certified" farms (67 in number) and 2,911 on the 77 licensed Grade A (T.T.) farms. In completion he gives a list of some of the causes responsible for sediment in milk.—D. S. RABAGLIATI.

I. RABAGLIATI, D. S. (1932). **Safe Milk.**—*Lancet.* **223.** 811.
II. DUNSTAN, W. R. (1932). **Safe Milk.**—*Ibid.* 920-921.
III. WRIGHT, N. C. (1932). **Safe Milk.**—*Ibid.* 1024-1025. [2 refs.]
IV. —. (1932). **The Milk Problem.**—*Brit. Med. J.* May 21st. 944-945. [4 refs.]

I. & II. These refer to correspondence as to the percentage of the various grades of milk which contain tubercle bacilli. Rabagliati refutes certain statements which appeared in a previous issue of the *Lancet* [(1932). **223.** 707.] one of which was to the effect that no less than 3·8 per cent. of Grade A (T.T.) milk was thus contaminated. He quotes from the recent report of the chief medical officer of the Ministry of Health showing that this cannot have been the case. He draws attention to the defects in the Milk (Special Designations) Order of 1923 as regards the manner of issuing licences and stresses the need for the rigid control and standardization of tuberculin. The final goal must, however, be the complete eradication of tuberculosis from our herds.

Dunstan in his reply cannot agree with the previous writer and expresses the hope that the school medical officers will inform us of their experience in the matter of milk schemes.

III. The writer shows the almost complete safety of "Certified" and Grade A (T.T.) milk produced in Scotland, at least so far as tuberculous infection is concerned. He describes a careful piece of work carried out by the Hannah Dairy Research Institute. Out of 750 samples of the above mentioned grades of milk only one was found to contain tubercle bacilli. The institute also collected figures showing that, as the result of 28,221 tuberculin tests made on cows in the graded herds referred to, only 428 (1·5 per cent.) proved positive. This shows—allowing for 1 per cent. of the reactors to be possibly giving tuberculous milk—that only three cows out of 20,000 in such herds can be looked upon as actively dangerous. The author deplores the small demand there is for the available supply of tuberculosis-free milk already on the market and considers the scant encouragement given by the public for this class of milk to be a disaster.

IV. In an editorial calling attention to the recent report of the People's League of Health on "A Survey of Tuberculosis of Bovine Origin in Great Britain" [see this *Bulletin.* **3.** 169.] the general problem of the milk supply as it affects this country is discussed. The *British Medical Journal* considers the work of the League so thorough "that a Royal Commission, the appointment of which has been suggested, would not be likely to add anything of value to our knowledge and would certainly waste much time and money in covering the same ground."

The advantages and disadvantages of pasteurization are briefly summarized and while the writer is evidently in favour of the pasteurization of ordinary milk, satisfaction is expressed that the committee consider that the pasteurization of graded milk should be left to the discretion of retailers. The editorial concludes by stating that "To compel pasteurisation of graded milks would, in our opinion, stultify the elaborate care with which graded milk is produced. Grade A (T.T.) milk is as safe as is needed for every day life."—D. S. RABAGLIATI.

HARRIS, R. I., BERRY, A. E., MCKAY, A. L., & MCNABB, A. L. (1932). **The**

Menace of Raw Milk. I. Milk-Borne Tuberculosis. II. Typhoid Fever. III. Septic Sore Throat. IV. Undulant Fever. [Followed by Discussion]. —*Canad. Publ. Health J.* **23.** 1-20. [9 refs.]

The first author, discussing bovine tuberculosis in man, stresses the fact that its incidence is governed entirely by local conditions of living, agriculture and hygiene. The incidence of bovine tuberculosis in Canada is given as " 4 per cent. in 6 million cattle." It is noted, however, that under the accredited herd plan 13·5 per cent. of 368,887 cattle were slaughtered as reactors in the period 1919 to 1928 (CAMERON's figures). Statistics for bovine infection in man are taken from PRICE's work relating to 340 cases, mostly in children, bone and joint lesions predominating. Bovine infection was demonstrated in 13 per cent., in all of which raw milk had been consumed. No cases came from Toronto where pasteurization was carried out. Four per cent. of raw milk supplied to this city gave positive results in guinea pigs.

Berry, discussing the epidemiology of typhoid fever, points out that this disease still accounts for over 50 per cent. of milk-borne epidemics but that the number of cases has decreased notably, chiefly because an increasing proportion of outbreaks occurs in rural areas ; the freedom of the larger towns is attributed to efficient water treatment and to pasteurization of the milk.

After a general survey of the epidemiology of septic sore throat, the third author quotes SCAMMAN's figures for the United States of America, pointing out that in regard to the number of cases septic sore throat heads the list of milk-borne diseases and that in respect of mortality it is second only to typhoid. A summary is then given of the Kirkland Lake epidemic affecting 457 persons. [See this *Bulletin.* **3.** 218].

Undulant fever is discussed under the following headings :—frequency of brucella infection in cattle, the causative agent, incidence of *Br. abortus* in milk, laboratory identification, incidence of human infection in Ontario, occupation and source of infection, symptoms and prevention. According to MITCHELL, 20 per cent. of dairy cattle are affected and 1 per cent. excrete *Br. abortus* in the milk. Other workers who tested 1,140 cattle, amongst which 100 abortions occurred, classed 30 per cent. as positive at the first test. The incidence of milk infection amongst reactors was 30 and 43 per cent. in different series of experiments.

Four out of 1,000 Wassermann samples agglutinated *Br. abortus* at 1 : 20. Amongst 856 samples submitted in 1928 for typhoid examination, 1·9 per cent. were positive. Of 1,125 submitted in 1930, 4·8 per cent. were positive. A similar figure was obtained for 1931. The incidence of cases of undulant fever is given as 2 per 100,000, the vast majority being in dairy and farm workers and rural residents.

Pasteurization is put forward as the effective remedy for all these diseases.

—A. W. STABLEFORTH.

WELCH, H., & MICKLE, F. L. (1932). **Bacteriological Studies of a Milk-Borne Outbreak of Scarlet Fever.**—*Amer. J. Hyg.* **17.** 229-234. 2 figs. [3 refs.]

The outbreaks of scarlet fever and septic sore throat described were shown to be caused by *Streptococcus scarlatinae.* On recovery from the body fluids, the organism had a distinct capsule, and, on the basis of the TOPLEY and WILSON classification, would be classified as *S. epidemicus.* It is noted that no colonies showed the mucoid character of *S. epidemicus* and that JONES and LITTLE have recorded the capsulation of *S. scarlatinae.*

On inoculation of the haemolytic strain into rabbits both acute and chronic types of cases were produced. This does not support the contention of HADJO-

POULOS and BURBANK, who claimed that acute conditions were caused by true haemolytic strains and chronic conditions by *viridans* strains.—EDWARD F. PECK.

TANNER, F. W., & RAMSEY, R. J. (1932). **Food Poisoning due to a Yellow Micrococcus from Milk.**—*Amer. J. Med. Sci.* **184.** 80-85. [8 refs.]

During the course of an investigation into the cause of undesirable flavours in milk, one of the investigators became ill with severe gastro-enteritis. The cause appeared to be a yellow micrococcus which was isolated from milk which had undergone a change of flavour and, as far as could be ascertained, the milk was from the udder of a cow which was perfectly normal. The coccus showed a variation in pigment formation, producing a yellow-orange pigment on Loeffler's media whilst it was practically white when grown on agar. Several other human beings were ill with symptoms of food poisoning after ingestion of a pure culture of the organism which was being used to produce malt or caramel flavour in milk. Kittens became ill, but monkeys were resistant to the toxic agent.

The authors discuss the methods of rendering the milk supply safe and suggest the rejection of milk from abnormal udders and the inhibition of the growth of the common udder flora by prompt refrigeration followed by pasteurization. The micrococcus described is killed at the temperatures and times usually employed in pasteurization.

References to previous reports of food poisoning due to similar cocci, some of which had been isolated from milk, are given.—R. LOVELL.

I. ANDRESEN, P. H. (1932). Das Wachstum der Paratyphusbacillen in roher Milch. Eine epidemiologische Studie. [**The Growth of Paratyphoid Bacilli in Raw Milk. An Epidemiological Study**].—*Zschr. Hyg. u. Infektkr.* **113.** 530-540. 1 fig., 10 tables. [9 refs.]

II. STANDFUSS, R., & FRENZEL, W. (1932). Ueber hemmende Einflüsse der rohen und pasteurisierten Milch gegenüber Typhus- und Paratyphus-Enteritis-Bakterien. [**On the Inhibitory Influence of Raw and Pasteurized Milk on Typhoid and Enteriditis Bacteria**].—*Zschr. Infektkr. Haust.* **42.** 191-208. 9 tables, 1 chart. [3 refs.]

I. Paratyphoid bacteria grow very badly in fresh raw milk, whether taken aseptically or not. The inhibitory effect is preserved by efficient and immediate cooling of the milk, but is decreased in proportion to the bacterial content of the milk and is quickly destroyed by heating, a distinct effect being produced by heating at 56°C. for ten minutes. Full details are given of the methods used. A strain of *Bact. paratyphosum* B recently isolated from faeces was used, 500 to 2,000 bacteria per c.c. being added to the milk in 30 c.c. amounts. Counts were made on brilliant-green agar plates at once and after various periods at 37°C., 22°C. and 13°C., the latter being chiefly used.

II. By the inoculation of half or one litre amounts of milk with small numbers, usually 50 to 1,000, of various members of the salmonella group and plating out after from 6 to 32 hours at 4° to 20°C., an inhibitory influence was demonstrated in raw and, to nearly the same degree, in pasteurized milk ; this was absent or present to only a slight degree in boiled milk. The inhibitory influence was detectable immediately after sowing, reached its highest after one day and disappeared after a further 12 hours. For the recognition of the bacteria, enrichment in 20 per cent. bile broth gave results much superior to the simple plating of centrifuge deposit.—A. W. STABLEFORTH.

THERAPEUTICS.

I. GRASSET, E. (1932). **Concentration of Polyvalent African Antivenom Serum.**—*Trans. Roy. Soc. Trop. Med. & Hyg. London.* **26.** 267-272. 2 tables. [15 refs.]

II. GRASSET, E., & ZOUTENDYK, A. (1932). Méthode rapide de préparation de sérums antivenimeux polyvalents—antivipéridés et Cobras—au moyen des anavenims formolés. [**A Rapid Method of preparing Antiviperidae and Anti-Cobra Serum by Means of Formolized Venins**].—*C. R. Soc. Biol. Paris.* **111.** 432-434. [3 refs.]

I. The pseudoglobulin fraction of the polyvalent antivenin serum is obtained by the " salting out " process. Dessicated puff adder and serpedon [Ringhals] venom is used for standardizing the antiserum. The potency of the pseudoglobulin fraction shows a concentration of four to five times that of the original serum.

II. To dried cobra venin dissolved in broth [1 : 100] 0·75 per cent. of formol is added which renders it atoxic within a month. Viperidae venin is dissolved in physiological saline and 0·3 per cent. of formol is added. Using detoxicated venins, horses are immunized within two months as compared with from 12 to 16 months when using unmodified venin.—E. J. PULLINGER.

RICHET, C., fils, & DUBLINEAU, J. (1932). Pyrétothérapie associée ou non à l'arsénothérapie dans la trypanosomiase expérimentale de la Souris (Nagana). [**Combined Pyretotherapy and Arsenotherapy in Experimental Trypanosomiasis of the Mouse (Nagana)**].—*C. R. Soc. Biol. Paris.* **109.** 641-643. 3 tables. [5 refs.]

Working with nagana-infected mice the authors compared the effect of exposure to 37°-38°C., and to 42°-45°C., for 1½ to 2½ hours on four successive days, with the combined effect of exposure and treatment with subcurative doses of 914 Billon (6 mg. per kg. body weight, administered the day after infection).

They concluded that the effect of pyrotherapy alone was negligible but that the combined treatment increased the survival time and could even reduce mortality. The survivals, however, were only 2 out of 34 for treatment at 37°-38°C. and 2 out of 22 for treatment at 42°-45°C.—H. H. GREEN.

MARZINOWSKY, E. J. (1932). Ueber die kombinierte Wirkung von Novarsolan und ultravioletten Strahlen auf Trypanosomen. [**The Combined Trypanocidal Effect of Novarsolan and Ultra-Violet Irradiation**].—*Zschr. Immun.-Forsch.* **74.** 379-383. 1 table.

An experiment from Moscow offered in confirmation of the observation of G. ROSKIN, which failed to find support in Germany.

Twenty-four mice were infected with *Trypanosoma equiperdum* and on the fourth day, when trypanosomes appeared in large numbers in the peripheral blood, all received the same subcurative dose of novarsolan. Fourteen were at once irradiated with ultra-violet light for 15 minutes, the remaining ten serving as controls.

The controls all died between the 6th and the 14th day. Twelve of the irradiated mice survived from 13 to 30 days (average 2·5 times as long) and three of these survived beyond the observational period. Trypanosomes disappeared from the peripheral blood the day after irradiation.—H. H. GREEN.

I. KELSER, R. A., & MOHRI, R. W. (1932). **Comparative Germicidal Tests of Mercurochrome and Tincture of Iodin.**—*J. Amer. Vet. Med. Ass.* **80.**

87-95. 1 fig., 2 tables. [13 refs.]

II. McCulloch, E. C. (1932). **The Value of Iodin in Cattle Practice.**—*Ibid.* 686-696. [36 refs.]

I. Mercurochrome is not a satisfactory skin disinfectant for use in veterinary practice and is distinctly inferior to tincture of iodine. It is also ineffective as a germicide in presence of blood, serum and tissue exudates [compare this *Bulletin.* **2.** 333 and **3.** 222].

II. A general article discussing the iodine requirements of normal animals, maladies associated with iodine deficiencies (" hairless-pig malady," goitre in calves, reduced milk production in cows), sources of iodine, therapeutic uses, danger of overdosage, use as an alterative and as a disinfectant. In this last connection iodine is regarded as much superior to mercurochrome [see this *Bulletin.* **3.** 222], and to hexylresorcinol.—H. H. Green.

Stanley, W. M., Coleman, G. H., Greer, C. M., Sacks, J., & Adams, R. (1932). **Bacteriological Action of Certain Synthetic Organic Acids toward** *Mycobacterium leprae* **and other Acid-Fast Bacteria. XXI.**—*J. Pharmacol. & Exp. Therap.* **45.** 121-162. 11 figs., 22 tables. [38 refs.]

A large number of organic acids have been synthesized and their action on *Mycobacterium leprae* tested *in vitro.* At first acids similar in structure to chaulmoogric acid were prepared and it was found that they all possessed some analogous bactericidal activity, whilst the straight chain acid, stearic acid, of similar molecular weight had no such activity. It was later found that straight chain acids of similar molecular weight, but with the acid carboxyl not at the end of the carbon chain, had bactericidal activity. In general the aqueous solutions of the sodium salts of the most effective acids were very soapy, whereas the ineffective acids were not. Surface tension and bactericidal effect parallel each other to a point, thus, with decrease in molecular weight of the acids below 250, a drop in bactericidal effectiveness and in surface tension effect is found, but increase in molecular weight above 256 is accompanied by a drop in bactericidal effectiveness, but without a corresponding decrease in surface tension effect. Therefore other factors besides surface tension effects are of importance in this bactericidal effect. The compound ethyl di-n-heptyl acetate has been chosen for clinical trial.

—W. R. Wooldridge.

POISONS AND POISONING.

Otanes, F. Q. (1932). **Notes on a Venomous Spider in the Philippines.**—*Philippine J. Agric.* **3.** 83-88. 2 plates. [2 refs.]

The author describes a spider eventually identified as " *Latrodectes* sp.—near *hasselti* Thorell " which was sent in by a planter, who had lost two cattle following bites by the spider.

No further description of the symptoms in the cattle is given here, most of the article being devoted to a review of the knowledge of the *Latrodectes* genus, members of which have also been found poisonous for human beings and fowls.

—J. E.

—. (1932). **Common Salt Poisoning.**—*J. S. Afric. Vet. Med. Ass.* **3.** 49-50.

In cases where animals have had scanty supplies of salt, it occasionally happens that, on gaining access to a salt lick, sufficient salt is ingested to cause toxic effects. The dose is quoted as from $1\frac{1}{2}$ to 5 lb. for cattle, and from 4 to 8 oz. for sheep.

In peracute cases, the animals show extreme thirst, depression, excitement, abdominal pain and death in collapse, with a negative *post-mortem* picture in most cases.

In less acute cases, profuse watery diarrhoea, which may become haemorrhagic, sets in. Pregnant animals may abort. On *post-mortem* examination, gastro-intestinal inflammation and injection of the cerebral membranes are generally found.

The prognosis is grave and the best remedy is prevention by allowing free access to licks.—G. D. LANDER.

JODLBAUER, A. (1932). Der Kalkverlust im Blute bei Vergiftung mit Oxalaten und Fluoriden. [**The Loss of Blood Calcium in Poisoning by Oxalates and Fluorides**].—*Arch. exp. Path. u. Pharmakol.* **164.** 464-468. [4 refs.]

The author studied the blood calcium content by Warrd's method [(1919). *Biochem. Zschr.* **97.** 176.] in a number of rabbits and fowls which were given various toxic doses of sodium oxalate and sodium fluoride. Both acute and chronic poisoning were studied. It was found that the blood calcium fell 25 per cent. in acute oxalate and 50 per cent. in acute fluoride poisoning respectively: the analagous figures for chronic poisoning were 17 and 13 per cent. respectively (for oxalate and fluoride). The animals employed in the experiments showed considerable powers of recovery after having received one large toxic dose, their blood calcium returning to normal after a few hours.—J. E.

TRABAUD, MURCHED-KHATER, CHATY, & MOUHARRAN. (1932). Le Lathyrisme en Syrie. [**Lathyrism in Syria**].—*Bull. Acad. Méd. Paris.* **107.** 260-263.

The authors observed cases of lathyrism in man consequent on food shortage during the war. They ascribe the damage to *Lathyrus sativus* and not to *L. cicera* or *L. clymenum*. No symptoms were produced on feeding grains to fowls, dogs and a monkey, and attention is drawn to the fact that the grain is cultivated as a feed for oxen and camels.—G. D. LANDER.

KROPF, R. (1932). Solaninvergiftung bei Rindern. [**Solanine Poisoning in Cattle**].—*Wien. tierärztl. Mschr.* **19.** 105-107.

An account is given of the symptoms caused in a cow and a young steer by green feeding of potato haulm. Each animal displayed swollen extremities, reddening of the skin of udder or scrotum and sensitiveness of the affected parts. Numerous small blisters were noticed on the buccal mucosa. Recovery ensued within several days.—G. D. LANDER.

RUPPRECHT, K. (1932). Rübenvergiftung bei Schweinen. [**Beet Poisoning in Swine**].—*Wien. tierärztl. Mschr.* **19.** 557-558.

A few hours after a feed of meal and beet, 2 out of 14 pigs died showing paleness of the skin, brown colouration of the blood and a little intense redness of the stomach wall. The fatality is ascribed to oxalic poisoning, which has been previously observed after the eating of beet leaves. In view of the slight gastro-enteritis observed, the author suggests that the toxic action may be due to potassium (as oxalate) rather than to oxalic acid, the potassium oxalate causing dangerous calcium deficiency in the blood.—G. D. LANDER.

PHYSIOLOGY.

I. SHARPEY-SCHAFER, E. (1932). **Observations on the History of Physiology in Great Britain during the Last Hundred Years.**—*Brit. Med. J.* Oct. 29th. 781-783.

II. Dale, H. (1932). **The Relation of Physiology to Medicine in Research and Education.**—*Ibid.* Dec. 10th. 1043-1046.

III. Lewis, T. (1932). **The Relation of Clinical Medicine to Physiology from the Standpoint of Research.**—*Ibid.* 1046-1049. [2 refs.]

I. An address giving briefly the history of the growth of physiology in Great Britain.

II. The author briefly refers to the development of physiology and to the growth of its relative independence of medicine. He points out the value of this independence to both physiology and medicine, but strikes a note of warning against too wide a separation. Whilst indicating the importance of experimental physiology on lower animals to that of man, he yet welcomes the recent tendency of the clinician to return to experiment himself and not to rely entirely upon the results of the pure laboratory worker. The position of physiology in the medical curriculum is discussed. The real object of the medical curriculum should be to train the student to observe, to think and to form a reasoned judgment and not to make confused and evanescent records on his memory. Physiology is pre-eminently fitted for training the mind in the conditions of accurate observation, in the meaning of quantity and measurement, in the putting of questions to nature and the appraisement of the answers obtained.

III. Clinical medicine should make a determined effort to take its proper place as a progressive science on an equal footing with physiology. Much physiological work is directly or indirectly suggested by clinical problems and many clinicians in their search for explanations of the abnormal phenomena which they witness often themselves become heavy contributors to physiological knowledge. Clinical medicine has its own proper field of experimental work. It is work that is carried out upon patients suffering from disease ; it can be undertaken only by clinicians, and these should be clinicians having special facilities and training and having judgment to know how far experiment is consistent with the complete welfare of the patient.—W. R. Wooldridge.

I. Cruickshank, E. W. H. (1932). **The Normal and Morbid Physiology of the Thyroid Gland.**—*Canad. Med. Ass. J.* **26.** 647-653. [26 refs.]

II. Spence, A. W. (1932). **The Effect of Vitamin Deficiency on the Structure of the Thyroid and Thymus Glands.**—*Brit. J. Exp. Path.* **13.** 157-166. 3 figs. [21 refs.]

I. A general paper given before the Medical Society of Nova Scotia, in which the structure of the gland, the action of thyroxine, the action of iodine in simple and in exophthalmic goitre, the theories of thyrotoxicosis, the relation of thyroid to pituitary, to pancreas and to gonads, are discussed.

II. Twenty-four rats were kept on a ration inadequate in vitamins A, B, C and D, upon which McCarrison [(1927). *Ind. J. Med. Res.* **15.** 247.] had previously produced lymphadenoid goitre. Experiments varied from 9 weeks to 13 months, death being warded off during the longer periods by occasional brief reversion to standard diet.

Lymphadenoid goitre did not arise but simple goitre was produced in 15 rats, and explained on grounds of avitaminosis and infections. An outstanding feature was the occurrence of keratinization cysts in the thyroids in 23 out of the 24 animals, arising from the vesicles probably by exhaustion. Similar cysts were found in the thymus of 3 animals and considered to be large Hassall's corpuscles. There was no evidence that any of the cysts represented distensions of the thyroid-thymic lymphatics.—H. H. Green.

I. Küst. (1932). Der derzeitige Stand der hormonalen Trächtigkeitsfeststellung bei der Stute. [**The Present Position of the Hormonal Diagnosis of Pregnancy in the Mare**].—*Deuts. tierärztl. Wschr.* **40.** 336-339. 1 table. [15 refs.]

II. Küst. (1932). Die Feststellung der Trächtigkeit der Stute durch den Hormonnachweis im Blute. [**The Diagnosis of Pregnancy in the Mare by the Demonstration of Hormone in the Blood**].—*Berl. tierärztl. Wschr.* **48.** 817-819.

III. Langlotz, K. (1932). Untersuchungen über die Feststellung der Trächtigkeit des Rindes durch den Nachweis des Ovarialhormons im Harn. [**Experiments on the Diagnosis of Pregnancy in Cattle by the Demonstration of the Ovarian Hormone in the Urine**].—*Inaug. Diss. Giessen.* pp. 27. 4 tables. [36 refs.]

I. The author reviews the progress that has been made in the early diagnosis of pregnancy in the mare [see also this *Bulletin.* **3.** 50.] by the demonstration of the ovarian hormone in the urine and blood serum. Contrary to Zondek's method, utilizing urine treated with ether before injection into infantile white rats, the author found the use of pure urine and infantile white mice more reliable. He also considers that blood serum gives an even more reliable result than urine. In all his experiments there has been a small percentage of misleading results—usually positive results from mares in oestrum or with ovarian disease. These are discussed fully.

It appears, however, that this biological method of diagnosing pregnancy should be valuable in horse-breeding practice. It is only of value in the first half of the gestation, the hormone secretion diminishing thereafter.

II. The author describes further progress and prefers the use of blood serum to urine. The question of the minimum number of mice required and the dosage of serum, etc., is still receiving attention.

III. The author applied the technique of Küst in an investigation to determine whether the ovarian hormone is excreted in the urine of pregnant cows. He found that, using urine treated with ether, positive results could be obtained from the 23rd week of gestation, whilst pure urine gave positive results from the 29th week. This does not constitute an early diagnosis and therefore the method as at present elaborated is of no practical importance for cattle.—J. E.

I. Adler, K., & Wiederhold, O. (1932). Calcium- und Kaliumstoffwechsel unter dem Einfluss der Röntgenstrahlen bei Kaninchen. I. Mitteilung. Blutserum und Haut. [**Calcium and Potassium Metabolism of Rabbits under the Influence of Röntgen Irradiation. Part I. Blood Serum and Skin**].—*Strahlentherapie.* **44.** 383-392. 3 tables. [13 refs.]

II. Adler, K., & Adler, M. (1932). Calcium- und Kaliumstoffwechsel unter dem Einfluss der Röntgenstrahlen bei Kaninchen. II. Mitteilung. Ausscheidung. [**Calcium and Potassium Metabolism of Rabbits under the Influence of Röntgen Irradiation. Part II. Excretion**].—*Ibid.* 481-488. [5 tables].

I. The authors investigated the calcium and potassium content of blood serum and skin of rabbits exposed to Röntgen irradiation at the rate of 1,000 R.P.H. for one to five hours over the whole back (skin samples taken by excision from the back).

They found a fall in mineral content amounting in extreme cases to 35 per

cent. of the original value for serum calcium, 25 per cent. for serum potassium, 57 per cent. for skin calcium and 61 per cent. for skin potassium.

II. Analyses of excreta and food showed increased elimination of calcium during the first day after irradiation followed by retention thereafter, and increased elimination of potassium over four to five days with subsequent retention.

Since fall in serum potassium was rapid but highest elimination of potassium (and of water) occurred on the third day, temporary retention in unspecified tissues is suggested.—H. H. GREEN.

SASLOW, G. (1932). **The Effect of Washing upon the Resistance of Erythrocytes to Hypotonic Solutions.**—*J. Physiol.* **74.** 262-270. 8 tables. [16 refs.]

Using BRINKMAN'S physiologically equilibrated salt solutions or ordinary isotonic salt solutions and washing one, two or three times, the author has been entirely unable to confirm the observation of BRINKMAN and VAN DAM that washed rabbit red cells are more resistant to hypotonic solutions than untreated cells.

The resistance of these cells to a given hypotonic solution seems, within limits, independent of pH (from 5·38 to 7·35), buffering capacity, or salt balance of the isotonic washing fluids used to prepare the suspensions.—A. W. STABLEFORTH.

MASON, Ethelwyn M. (1932). **The Iodine Content of the Blood. Its Relation to Potassium-Iodide Feeding.**—*New Zealand J. Sci. & Tech.* **14.** 32-37. 4 figs., 1 table. [5 refs.]

Potassium iodide was fed weekly to six cows in quantities of one, five or ten grains. From the results it is concluded that, where iodine feeding is practised, very small amounts to which the animal has access at all times are likely to prove more beneficial than a single large dose, as in the former case the blood iodine value remains at approximately the normal level for a long period whilst in the latter instance a large increase in blood iodine results soon after the feed, but fairly quickly disappears.—W. R. WOOLDRIDGE.

BLUM, H. F. (1932). **Photodynamic Action.**—*Physiol. Rev.* **12.** 23-55. [121 refs.]

A very convenient review article the detail of which will be appreciated not only by biologists generally, but by veterinarians concerned with the practical aspects of photodynamic effects [see this *Bulletin.* **2.** 99]. The present abstract can only indicate the nature of the original.

The term " photodynamic action " is used in the narrower sense of " sensitisation to light by substances not normally present in biological systems," a definition which excludes the general effects of light upon organisms.

In photosensitized reactions the sensitizing substance acts as a light absorber which, while remaining unchanged itself, brings about reactions between other components of the system not normally affected by light. The classical instance given (RAAB, 1898) is the combined effect of acridin and light on *paramecia*, organisms not affected by light alone nor in the dark by the concentrations of acridin used.

In general the sensitizer is activated by radiations corresponding to its absorption range, the short-lived activated molecules then parting with their energy to other components of the system. Thus HERTEL found that light of 518mμ destroyed bacteria sensitized with eosine whereas light of 448mμ did not, only the former wave-length lying within the absorption spectrum of the dye. In the same way SUPNIEWSKY found that rabbit's intestine was sensitized by haematoporphyrin only to wave-lengths which this substance absorbs.

The process is regarded as essentially oxidative and the presence of molecular oxygen is apparently required—a fact which differentiates photodynamic phenomena from the ordinary destructive effects of ultra-violet light on biological systems. There is evidence pointing to intermediary formation of peroxide, and reducing agents or readily oxidizable substances frequently inhibit photodynamic reactions.

The nature of the so-called " dark reaction " and its relation to the " photo reactions " are discussed at considerable length.

In discussing types of photodynamic effect a broad distinction is drawn between effects on small organisms readily penetrated by light, and effects on larger organisms in which the primary action is confined to the surface layers. Amongst illustrations of the former is the interesting production, by *Haemophilus influenzae*, of a substance which haemolyses red blood corpuscles when irradiated.

The effects on isolated tissues and organs are finally discussed and the article concludes with examples of photodynamic action on large animals. These include the familiar fagopyrismus of animals fed chiefly on buck-wheat, the poisoning of range animals in western America by *Hypericum punctatum* (St. John's wort) and the poisoning by *Hypericum crispum* which is said to explain why only black sheep (pigment-protected) are reared in certain parts of Italy.

[For species of St. John's wort causing mortality of sheep and cattle in Australia—see CALVERT, this *Bulletin*. **1.** 71. For photodynamic action in relation to " geeldikkop," a disease of sheep and goats in South Africa, commonly caused by *Tribulus terrestris*—see QUIN, this *Bulletin*. **2.** 99].—H. H. GREEN.

I. BIDDER, G. P. (1932). **Senescence.**—*Brit. Med. J.* Sept. 24th. 583-585. [5 refs.]

II. WIESNER, B. P. (1932). **The Experimental Study of Senescence.**—*Ibid.* 585-587.

I. The work of other authors relative to " senescence " is briefly considered. It is suggested that growth does not cease of its own accord yet cessation of growth is essential to efficiency. Hence adequate efficiency can only be maintained by the evolution of some mechanism that arrests natural growth as soon as specific size is reached. Senescence is the result of the continued action of the regulator after growth is stopped.

II. A preliminary report upon the problem of senescence as seen in a colony of approximately 3,000 rats. Senescence is not absolutely correlated with absence of ovarian or testicular function. The senescence of the gonad seems to be due to the lack of the specific stimulating factor represented by the gonadotropic hormones of the anterior lobe of the pituitary, and not to any general condition of the organism or to the absolute age of the gonad itself.

Many senile animals can react with considerable growth to the administration of growth-promoting extracts. Growth was measured by increase in weight, obesity and other pathological conditions being absent.—W. R. WOOLDRIDGE.

FLEMING, A. (1932). **Lysozyme.**—*Proc. Roy. Soc. Med. London.* **26.** 71-84. 2 figs., 9 tables. [16 refs.]

A review of the literature on lysozyme, the enzyme that is found in most tissues and which lyses many bacteria. It is most strongly present in egg white and in human tears. The activity of various tissues of several animals are compared. The cat tissues are poor in the enzyme except the salivary glands. Certain canine tissues contain large amounts, although usually less than that present in the corresponding human tissue. The spleen and kidney contain most in the dog. The enzyme was usually tested against a suspension of *Micrococcus lysodeikticus*, but tables of results with other organisms including pathogens are given. The

author makes the following claims :—(1) that lysozyme is a widely distributed antibacterial ferment which is probably inherent in all animal cells and constitutes a primary method of destroying bacteria ; (2) that lysozyme, whilst acting most strikingly on non-pathogenic bacteria, can, when allowed to act in the full strength in which it occurs in some parts of the body, attack pathogenic organisms ; (3) that it is very easy to make bacteria relatively resistant to lysozyme, so that any pathogenic microbe isolated from the body where it has been growing in the presence of a non-lethal concentration of the enzyme must have acquired increased resistance to the ferment and (4) that there are some differences in the lysozyme of different tissues and in different animals whereby bacteria are susceptible to different lysozymes in varying degrees.—W. R. WOOLDRIDGE.

FRENCH, M. H. (1932). **Animal Nutrition Research.**—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb. Tanganyika. 1931.* pp. 32-46. 13 tables. [5 refs.]

The author reports on the initial work in the chemical analysis, nutrition-values of foodstuffs and feeding experiments on livestock to be undertaken on an effective scale in the territory. Owing to the lack of space it is only possible to give an indication of the ground covered.

Pasture grasses from three different areas were analysed: great differences in their protein, fibre and ash contents were found and the avoidance of one pasture even by game was explained by its poor nutritive value.

Various foodstuffs in local use were analysed ; the materials tested included sweet potato vines, oil cakes, bran and dried grains, blood meal and bone meal, oats, beans and linseed. This essential work will greatly facilitate future nutritional experiments.

Two feeding trials were carried out, the first on two groups of six and five beasts respectively, the one group receiving a supplement containing a high percentage of protein and the other receiving a low protein supplement. The purpose of this trial was to ascertain whether it was worth while to give a high protein supplement to cattle during the latter part of the dry season. Each group had similar grazing and silage rations. It was found that a low protein supplement was more economical than a high one. The blood calcium and phosphorus values for the test animals are also given.

In the second feeding trial, four groups of cattle comprising 24 head were used. All had similar grazing, one was a control group, the second received bone meal and salt, the third bone meal, salt and blood meal and the fourth bone meal, salt and cotton-seed. The trial lasted for some three and a half months and the results showed that, as judged by live weights, the fourth group did best, followed in sequence by the third, second and first, with the widest gap in the middle : cotton-seed also proved to be best economically. The mineral-alone group, though looking very well, did not do so much better than the controls : thus it appeared that mineral deficiency is unimportant locally.

Digestibility experiments with hay were started with two oxen and are still proceeding.

Blood analyses of 13 head of native stock were made in respect of calcium and phosphorus. In adult cattle the values were very constant whilst, in growing and lactating animals, a drop in phosphorus with a rise in calcium was common.—J. E.

TECHNIQUE.

PANGALOS, G. E. (1932). La gélose au lait, milieu électif pour les microbes du

groupe *Brucella*. [**Milk Agar, a Selective Medium for Organisms of the Brucella Group**].—*C. R. Soc. Biol. Paris.* **111.** 504-505. [1 ref.]

Pangalos states that none of the media usually employed for the cultivation of brucella produce a rich growth. The agar medium used by OLITZKI and GUREVITCH for blood cultures is satisfactory, but is difficult to prepare.

He recommends a medium consisting of goats' milk incorporated with 10 per cent. agar. On this medium brucella [presumably all brucella] grows abundantly, the only disadvantage being that the medium is not transparent.—T. M. DOYLE.

MACH, R. S., & MACH, E. (1932). Hémoculture de Bacilles acido-résistants par la méthode de Loewenstein. [**Blood Culture of Acid-Fast Bacilli by Loewenstein's Method**].—*C. R. Soc. Biol. Paris.* **109.** 722-724. [1 ref.]

Of 60 cases of pulmonary tuberculosis only ten gave positive blood cultures by Loewenstein's technique. Microscopic examination of the culture debris was necessary before bacilli could be demonstrated. Two cases of acute polyarticular rheumatism yielded acid-fast organisms in a similar manner, but until macroscopic cultures have been obtained it is impossible to decide on the nature of such organisms.—NORMAN HOLE.

RITTER, W., & DORNER, W. (1932). Behebung eines wichtigen Nachteils des anaeroben Pyrogallolverschlusses. [**Removal of a Serious Drawback of the Anaerobic Pyrogallol Plug**].—*Zlb. Bakt. I.* (*Orig.*). **125.** 379-383. [7 refs.]

It can be shown that the pyrogallol and sodium hydroxide plug used in anaerobic technique results in the absorption of the carbon dioxide from the culture and thereby inhibits the growth of sensitive bacteria completely, and that even with small amounts of caustic soda this action may be apparent. The authors recommend, therefore, the replacement of the sodium hydroxide by 1 cm. of cold saturated sodium carbonate solution. The usual plug is pushed down and above this is placed an absorbent plug saturated with 0·5 to 1 cm. of 20 per cent. pyrogallol on which is placed the sodium carbonate solution ; the whole is then sealed. A comparison of the new and the old methods using 8 strains of true milk-souring bacteria, *B. amylobacter*, *B. putrificus*, and a propionic acid bacterium showed the superiority of the sodium carbonate method. No difference was found in the case of *Bact. coli*, *Bact. aerogenes*, and a sarcina.—A. W. STABLEFORTH.

I. JENKINS, C. E. (1932). **A Displacement Method for estimating the Cell-Volume in Blood.**—*Brit. J. Exp. Path.* **13.** 127-130. 1 table. [4 refs.]

II. PONDER, E., & SASLOW, G. (1932). **A Note on the Viscosity Method for measuring Percentage Volume of Cells in Blood.**—*J. Physiol.* **74.** 15P-16P. [8 refs.]

I. In this paper a modification of the ordinary haematocrit method is described for estimating the cell volume in blood. The blood is first centrifuged in the haematocrit and 50 per cent. of the supernatant plasma is then carefully removed and replaced by an equal volume of autogenous haemolysed plasma. The tube is shaken and recentrifuged for a few minutes when a portion of the cell-free supernatant is removed. From an estimation of the haemoglobin content of this supernatant and that of a standard, the percentage cell volume of the blood can be calculated. Using this method, results are obtained which are smaller than those found by the haematocrit method. Theoretically one would expect the cell volume to be less than that found in the latter method owing to the fact that intercellular spaces are not completely obliterated by the centrifugation.

II. Experiments, in which the percentage volume of the cells in blood was varied from 29·1 to 3·6 by dilution with autogenous plasma, showed that the viscosity method for estimating cell volume is subject to wide variation and, therefore, inapplicable for accurate work.—W. R. WOOLDRIDGE.

BALOZET, L. (1932). Technique de la ponction de la rate chez le Chien. **[Technique of the Puncture of the Spleen in the Dog].**—*C. R. Soc. Biol. Paris.* **110.** 917-918.

For the diagnosis of canine leishmaniasis, the author recommends, as of secondary value to the trephining of the tibia, puncture of the spleen, which he performs with a hypodermic needle and syringe. The site is on the left side immediately behind the curve of the last rib in the middle of the animal's side. The dog is secured on a table in the sterno-costal position with legs extended. —J. E.

GOULSTON, Daphne, & MOTTRAM, J. C. (1932). **On the Technique of Exposing the Chorio-Allantoic Membrane of the Chick Embryo for Experimental Purposes.**—*Brit. J. Exp. Path.* **13.** 175-182. 5 figs. [1 ref.]

The authors have studied the effect of exposing the allantoic membrane of chick embryo to air on the sixth and the tenth days. They have come to the conclusion that the microscopic changes observed are identical with those described by a previous author as following exposure to X-rays and are really due to injury and attempts on the part of the membrane to repair damage.

An aseptic method of exposing the allantoic membrane is described.—C.McG.

—. (1932). **A New Automatic Drencher.**—*Queensland Agric. J.* **37.** 173-176. 3 figs.

This is a description accompanied by photographs of an automatic drencher designed in order to enable one person to handle and drench sheep with a measured quantity of the therapeutic agent. It consists of a reservoir which may be attached to the operator's back. Connected to the reservoir is a tube or hose-line with a measure, which, by the aid of valves, may be opened and closed by a lever. The measure may be either one or two ounces in capacity. The drencher is manufactured by a Brisbane firm.—R. LOVELL.

DOUGLAS, E., TOBISKA, J. W., & VAIL, C. E. (1931). **A Cage, Waterer, and Feed Cup for Experimental Rats.**—*J. Home Econ.* **23.** 45-48. 2 figs.

A brief description of a cheap and effective cage, etc. is given, together with illustrations. The cages are of two sizes, one for individual rats, consisting of galvanized wire screening having tin plates at top and bottom, and the larger or stock cage which is built on similar lines.

For weighed rations glass castor cups are used, and a non-scattering food cup is also described. The waterer consists of an ordinary 4 oz. bottle with a bent glass delivery tube.—G. W. DUNKIN.

FELDMAN, W. H. (1932). **Technic of Photomicrography.**—*J. Amer. Vet. Med. Ass.* **81.** 352-357. [4 refs.]

The author describes in detail a simple and straightforward technique for the preparation of photomicrographs. He points out that, in the first instance, the final result depends upon the quality of the section.

A method of arriving at the correct exposure, which is the crux of the problem, is described and the formulae for all the solutions used are given in full. The original should be consulted for details.—N. S. BARRON.

MISCELLANEOUS.

SMITH, J. (1932). **General Review of the Cattle Industry.**—*Ann. Bull. Dept. Anim. Health, N. Rhodesia.* pp. 4-8.

The meat producers of Northern Rhodesia have been protected against imported meat by restrictions imposed to avoid the introduction of stock diseases. When the restrictions imposed on importation of meat from Southern Rhodesia on account of foot and mouth disease can be removed, a source of cheap good quality meat will be available to Northern Rhodesian consumers. The author urges that Northern Rhodesian meat producers must make every effort to improve quality, which has up to the present been very low, and, in particular, must attempt to improve and maintain the condition of their cattle during the dry months by rotational close grazing and by the use of stored crops such as silage. Though the rancher could hardly adopt such measures, he could sell his cattle, whilst they were still in good condition, to the general farmer who would be in a position to feed more intensively. It is thought that the best results are likely to be obtained by co-operation between the producers, and the Government has already suggested the formation of a co-operative society for the sale of meat. The biggest consumers, the mining industry, have also offered every assistance. The producers cannot expect any assistance in the form of a tariff unless they can offer a supply adequate in quantity and quality.—U. F. RICHARDSON.

ROSS, I. Clunies. (1933). **An Extraordinary Fleece : A Genetic Conundrum.**—*Austral. Vet. J.* **9.** 32-34. 2 figs. [2 refs.]

In the portion of the fleece described there occurred a definite mosaic segregation of the wool into two types, a 46's quality and 5·5 inch staple in the one case and a 64 to 66's quality and 4 inch staple in the other.

The flock from which this sheep came was thought to have been originally either of Lincoln or of Leicester blood upon which Merino rams had been used for the last 30 years.—EDWARD F. PECK.

HENRY, A. (1932). Curieux méfaits occasionnés par les rats dans l'industrie des cuirs. **[Strange Damage to Leather caused by Rats].**—*Bull. Acad. vét. France.* **5.** 67-74. 7 figs.

This paper reports damage to box-calf hides, before completion of the tanning process, by the teeth of rats. The rats had nibbled along folds of the skins, producing double rows of teeth marks, which opened up during the process of stretching and left a permanent defacement. The value of the skins was reduced by from 30 to 40 per cent.—F. BULLOCK.

OFFICIAL AND OTHER REPORTS.

TANGANYIKA TERRITORY. (1932). **Annual Report of the Department of Veterinary Science and Animal Husbandry 1931.** [HORNBY, H. E.] pp. 59. Dar es Salaam : Government Printer. [fcp.] [shs. 2/50.]

The European staff was reduced to 45 persons during the year. Mr. F. J. MCCALL, the Director, retired, Mr. HORNBY was appointed Acting Director [since appointed Director] and Mr. EVANS Acting Pathologist.

DISEASE CONTROL.

ANTHRAX is epizootic amongst sheep and goats, being the most important cause of mortality in the latter. It also occurs sporadically in cattle and donkeys.

Vaccination is not performed unless there is a high mortality.

BLACKQUARTER does not give serious trouble. Vaccination is performed if the mortality in outbreaks is high.

TUBERCULOSIS is of negligible importance in cattle, the native zebu breed being believed to possess considerable natural resistance.

CUTANEOUS STREPTOTHRICOSIS is widespread in native cattle, but does not become severe except in animals whose resistance has been lowered by rinderpest : lesions may then cover a considerable area of the skin. This infection serves as a rough indicator of the age of a rinderpest outbreak.

TRYPANOSOMIASIS.—An accurate map showing the tsetse fly areas is in course of preparation and should be most valuable. Persistent "fly"-encroachment occurs in some places, so that cattle are continually being moved into " fly-free " areas, which are becoming overstocked. The Department for Tsetse Research continues to work on methods of reclamation of " fly-infested " land. Antimony therapy is useful curatively, but its universal application is uneconomical. [Full information on trypanosomiasis research is given in the report and a separate abstract of it appears on page 352].

EAST COAST FEVER.—No real progress in the eradication of this disease can be made until more information concerning its geographical incidence in the Territory, and the reasons for such distribution are available. Meanwhile cattle raising in infected areas is almost impossible.

PIROPLASMOSIS AND ANAPLASMOSIS are more common in regularly dipped herds, suggesting that the dipping prevents cattle from establishing a natural immunity. It is proposed to immunize all young cattle artificially when certain current experimental work is concluded.

RINDERPEST was more troublesome than in 1930, infection occurring most commonly by the movement of infected cattle : raw meat was regarded as another mode of spread in some cases. With regard to spread by game, it is now definitely considered that buffaloes, giraffes and wildebeestes are susceptible ; they have been found dead, apparently from this disease. Elands, warthogs, kudus and bushbuck are also believed to be susceptible in some degree.

Quarantine plus serum-alone inoculation was employed exclusively in 1931. The course of the disease in various provinces is described. It is intended to combat rinderpest in the future " by a combination of quarantine, vaccination of in-contact uninfected herds [formol glycerol vaccine] and vaccination plus serum inoculation of apparently still uninfected susceptible animals of infected herds."

CONTAGIOUS BOVINE PLEURO-PNEUMONIA remained confined to Masailand where there are four large quarantine areas carrying 110,000 head of cattle. It is considered that quarantine alone may lead to eradication owing to the increasing congenital resistance of cattle born in the area, provided that the disease in the quarantine areas remains quiescent as was the case in 1931.

FOOT AND MOUTH DISEASE.—Only one outbreak occurred ; it lasted for three months.

CONTAGIOUS PNEUMONIA OF GOATS.—Two outbreaks occurred.

PARASITIC DISEASES.—Those of greatest economical importance are ovine strongylosis, distomatosis in cattle, sarcoptic mange in goats and nasal bot infestation in sheep.

MISCELLANEOUS DISEASES.—Snotsiekte, plant poisoning by *Crotalaria*, and swine fever occurred to a small degree during the year ; there was nothing to report on diseases of equines, dogs and poultry.—J. E.

TANGANYIKA TERRITORY. (1932). **Report on the Work of the Veterinary**

Laboratory, Mpwapwa. [Hornby, H. E.]—*Ann. Rep. Dept. Vet. Sci. & Anim. Husb. 1931.* pp. 9-58.

The greater part of the report is composed of an account of the work of the laboratory. It includes statistics on the anti-rinderpest serum and vaccine production. An efficient protective dose of serum for an average native ox is 40 c.c. In the past, rinderpest virulent blood has often transmitted piroplasmosis : this complication is now eliminated by infecting by rubbing the nasal mucosa with material obtained from vesicles.

The remainder of the report deals with research on trypanosomiasis and rinderpest, with a new scheme of research on the analysis of local pasture grass with application to animal nutrition and with livestock improvement, the position of which is dealt with in an interesting and lucid manner. [For abstracts of these articles, see this *Bulletin.* **3.** 352, 356 and 387.]—J.E.

—. (1932). **Report on the Work of the Education and Research Division of the Ministry for the Year 1930-31. Part I. Research (Including Local Investigation and Advisory Work). Part II. Agricultural Education.**—*J. Min. Agric. London.* **39.** 521-536 and 627-640. 16 tables.

In previous years this annual report has been published as a separate volume. It is now published in three issues of the Ministry's journal [Part III deals with horticulture pp. 739-755]. Reference is made to the postponement of new activities pending the establishment of the Agricultural Research Council which commenced operations in October, 1931, and to the overshadowing of the research year by the financial crisis. The report deals mainly with government grants in aid of national and imperial agricultural research, local investigation and advisory work, scholarships and travelling research fellowships. Actual investigational work is published by the Ministry in a separate volume entitled " Reports on the work of Agricultural Research Institutes and on certain other agricultural investigations in the United Kingdom 1930-31," obtainable from the Ministry. During the year the number of advisers in veterinary science was increased from 6 to 11. Increased demands have been made for services in connection with poultry diseases and much work was done upon diseases of sheep. A total of 10 advisers in Dairy Bacteriology have been at work during the year. Brief reference is made to the work of the Foot and Mouth Disease Research Committee who have so far published four Progress Reports. Details of the various grants under these headings are given in the tables of the report. Educational grants are given in the form of maintenance and capital grants for higher agricultural education at universities and agricultural colleges, grants to local authorities for agricultural education, grants in aid of dairying and poultry schemes and scholarships for the children of agricultural workers. The figures given show that veterinary education in England received a total maintenance grant of £8,000, an increase of £1,850 on the previous year.—S. H. Gaiger.

BOOK REVIEWS.

Fischl, V. [of Schering-Kahlbaum A-G., Berlin] & Schlossberger, H. [of the Reichsgesundheitsamt]. (1932). Handbuch der Chemotherapie. Erster Teil. Metallfreie Organische Verbindungen. [**Treatise on Chemotherapy Part I. Non-Metallic Organic Compounds**]. pp. viii + 357. 30 tables. [many pages of refs.] Leipzig : Fischers Medizinische Buchhandlung. [8vo.] [RM. 34 single volume].

The authors consider that no existing reference work on the same subject is

sufficiently comprehensive and aim at filling the gap. The ambitious plan of the treatise augurs success. The whole ground is being covered in three volumes, of which the present deals only with the non-metallic therapeutic agents, leaving the arsenicals, antimonials and other metallic or metalloid (including iodine) derivatives to be covered in part 2. The third volume (announced by the publishers) will be "general," contain the subject index of the whole treatise, and conclude with a chapter on the present position of research in chemotherapy.

When completed the bibliography will probably run up to several thousand citations and the "Handbuch" should therefore become a standard reference work.

In the present volume there is a brief introductory chapter explaining the subdivisions of subject-matter and providing a general bibliography of standard text books, monographs and special articles on chemotherapy, pharmacology, bacteriology and other subjects cognate to the text. This is followed by twelve special sections each with its own appropriate bibliography of specialized papers, dealing *seriatim* with acyclic chlorine derivatives, unsaturated fatty acids, simple and oxy-derivatives of benzene and napthalene, amino acids, quinoline compounds, quinine and its derivatives, emetin and its derivatives, other substances of plant origin (glucosides, alkaloids, etc.), derivatives of acridin, other substances of the dye class (nitro and nitroso dyes, azo derivatives, etc.), colourless derivatives of urea (germanin, etc.), and finally the serum of man and certain apes in so far as chemotherapeutic properties are concerned.

Wherever possible the chemical configuration of compounds is given, and the relationship between structure and therapeutic action or pharmacological behaviour is indicated. When essentially the same product is marketed under various proprietary names in different countries the synonyms are usually given (e.g. p. 340, germanin equivalent to Bayer 205, naganol, Fourneau 309, moranyl).

The presentation of the subject matter is lucid, and it should relieve English readers to know that the modern short sentence German style is adopted. The volume can safely be described as essential to the shelves of relevant libraries.

—H. H. Green.

Seelemann, M. [Dr. Director of Department of Milk Hygiene at the Bacteriological Institute of the Prussian Research and Experiment Station for Dairying, Kiel]. (1932). Die Streptokokkeninfektionen des Euters insbesondere der gelbe Galt. [**The Streptococcal Infections of the Udder, especially Chronic Bovine Mastitis**]. pp. vii + 259. 29 charts, 46 tables. [219 refs.] Hannover : M. & H. Schaper. [8vo.] [RM. 14]

The work at hand is a valuable addition to the literature of mastitis, is made up largely of the author's own work, and may be strongly recommended to all who are concerned with disease of the mammary gland. In it Dr. Seelemann collects and analyses the observations and experiments which he has made during the intensive study of mastitis which he began at Kiel in 1926.

The material is arranged under the following headings :—historical remarks, occurrence and extent of chronic bovine mastitis, its economic significance, its causes, the path of infection and method of transmission, the technique of milk examination, bacteriology, the natural course of the disease and, finally, its treatment and control.

In the early chapters, attention is drawn to the widespread nature of the condition in both large and small herds and to the loss incurred which, in Germany alone, is put at RM.200,000,000. A single examination of quarter samples from 7,691 cows in 173 herds of various sizes, mostly in Schleswig-Holstein, showed that 33 per cent. of cows were abnormal and 19 per cent. suspect in at least one quarter.

Moreover, 8·6 per cent. of these abnormal animals were in their first lactation.

The author is emphatic that the usual cause of chronic bovine mastitis (*Streptococcus agalactiae*) is a stable entity and that an inversion of a saprophytic streptococcus is unlikely ; moreover, that when there is no possibility of contagion there is no disease. He also believes that the accessory causes usually cited, e.g. bad milking, have no influence on an uninfected udder and that no evidence has been found that they even assist infection. He is persuaded nevertheless to postulate some as yet unrecognized accessory agent. The method of spread is probably connected with milking.

Diagnosis occupies 50 pages and concludes with a description of the method of examination finally adopted at Kiel : a rough sediment test, microscopic examination, surface culture on agar and a combined test for reaction and amount of catalase. Fore milk is preferred and collected in 50 c.c. bottles containing one drop of formalin.

In the section on the bacteriology of mastitis Dr. Seelemann describes fully the streptococcus which his earlier observations led him to believe was the typical *S. agalactiae* and then refers to a streptococcus which, in later work, he found to be frequently associated with a similar condition, often in more than half the cases in a herd. Believing that this streptococcus has not previously been described, he names it *S. agalactiae atypische*. It is perhaps unfortunate that he has done this because the characters given for it are only slightly different from those of the form he regards as typical, and there is reason to believe that this so-called atypical streptococcus has been described already by other workers and may in other countries be more common than the streptococcus described by Seelemann as typical. Further there are more than two types of streptococcus which, because of their general similarity and of the similarity of the disease they cause, can legitimately be termed *S. agalactiae*.

The most interesting part of the work is that in which Dr. Seelemann considers the natural course of chronic bovine mastitis. Many infected quarters become normal at a new calving and remain so for a considerable period, but usually disturbance reappears sooner or later. Actual healing may, however, occur.

The section on treatment and control may be summed up as follows :—vaccination both prophylactic and curative is useless : measures of control to be recommended are segregation of infected animals and treatment of suitable affected quarters with rivanol, preferably during the dry period, combined with efficient stripping. Prophylactic control stands or falls according to the conditions on the farm and its personnel and management. Encouraging results were, however, obtained in two herds of ordinary type in which the personnel were carefully instructed in the necessary precautions and from which samples were examined every month or two for a period of two years.—A. W. Stableforth.

Lumière, A. (1931). Tuberculose. Contagion, Hérédité. **[Tuberculosis. Contagion, Heredity]**. pp. xxiii + 424. 50 text figs. Lyon : Joannès Desvigne et Cie. 2nd Edition. [8vo.] [Fr. 35.]

Although the views expounded by the author of this volume are somewhat heretical, they are supported by a mass of rather convincing and very interesting statistical and theoretical evidence. He has endeavoured to consider impartially the evidence for and against the view that tuberculous infection is the result of contagion or heredity. The chief points of his final summing up are as follows :—

The tubercle bacillus can only infect the adult human being by contagion under exceptional circumstances ; hereditary infection is supported by more convincing evidence : some of the facts supporting these statements are :—rarity

of conjugal or professional infections under severe conditions of exposure ; the frequency with which ancestral disease can be proved if sought, although often present in a latent form only ; the fact that of a family of children, of the same mother, but two fathers, the progeny of the tuberculous father will frequently die of tuberculosis at adolescence, whilst the others remain healthy although brought up in contact ; also the fact that children of parents affected with strictly " closed " tuberculosis frequently succumb, despite most rigorous precautions in early life.

The author admits infection by ingestion in young children, but he considers that the majority of such cases die young, and that adolescent tuberculosis is not a " flare-up " of infantile infection.

Tuberculin testing is not necessarily a guide to infection ; it is merely an anaphylactic reaction which may obtain equally well if infection has been attempted, but successfully resisted by the body.

The book is very readable and contains some interesting radiographs.

—NORMAN HOLE.

SCHÜRMANN, E. [Oberassistent, Institute of Pathology, Berlin Veterinary College]. (1932). Die wichtigsten Geflügelkrankheiten. [**The Most Important Diseases of Poultry**]. pp. 64. 32 figs. Berlin : Fritz Pfennigstorff. [fcp. 8vo.] [RM. 1.]

This is a small and well illustrated booklet published for the use of poultry keepers with the object of making them acquainted with the appearance of all the important diseases of domestic poultry. The photographs included are very useful to that end.

Methods of treatment are not given in great detail and the reader is told that he cannot profitably attempt to do this work himself, a wise counsel. The author explains how to prepare and despatch dead specimens for laboratory diagnosis.

The book should be very useful to poultry farmers.—J. E.

KRAUS, R., & WERNER, F. (1931). Giftschlangen und die Serumbehandlung der Schlangenbisse. [**Poisonous Snakes and the Serum Treatment of Snake Bites**]. pp. vi + 220. 98 figs. [numerous classified refs.] Jena : Gustav Fischer. [8vo.] [RM. 13.50].

The authors have collaborated in the writing of this compendium, in order to fill a gap in the literature on the subject.

There are 14 chapters giving information on all aspects of the subject, even including one on snakes in legend and art. The first half of the book deals systematically with the families and species of poisonous snakes and is richly illustrated. The second half concerns the applied aspect, the mechanics of snake bite, the composition and the effects of venom on animals and human beings, the immunological aspects of snake bite—the variation in the susceptibility of different animal species to the venoms of different snakes—and the preparation and use of immune serum ; this section is presented in great detail.

The oldest snake-serum institute in the world, the Butantan Institute at São Paulo, Brazil, is described and illustrated by photographs.

The book will be very valuable to all interested in snake poisoning.—J. E.

BARKER, M. L. [M.A., Ph.D. Lecturer in German, University of Edinburgh]. (1933). **Basic German for Science Students.** pp. xi + 164. Cambridge : W. Heffer & Sons Ltd. [8vo.] [6s.]

This book is the outcome of the author's experience of teaching German to

science students to enable them to read German scientific literature.

It is written in two parts, the first part dealing with general vocabulary and grammar, including 650 of the first thousand basic German words, which are printed in heavy type for convenience, and passages of prose with the English translation on the opposite page.

The second part consists of six sections containing a number of selected extracts from literature of the following sciences, with the English translation :—chemistry, zoology, botany, physics, mathematics and medicine.

The author has confined his material to the minimum necessary amount so that the student is not appalled by a large volume of grammar having to be mastered. The basic words must be learnt thoroughly. Having studied the first part, the student can proceed straight to the acquirement of a technical vocabulary for his scientific reading by a study of the second part. In the section on medicine, the selected passages have been excellently chosen.

The book concludes with a German-English vocabulary of nearly 30 pages which should be a great advantage to the student.

The author is to be congratulated in catering for a long-felt want among students of the natural sciences and of medicine. For those having no previous knowledge of German the book is invaluable and the student hitherto confronted by bulky general grammar books with all their redundant colloquial matter will be able to acquire a reading knowledge of German by easy spare-time study of this small but efficient book : its low price makes it accessible to all.—J. E.

GRAHAM, S. [M.D., F.R.F.P.S.Glas., Leonard Gow Lecturer on the Medical Diseases of Infancy and Childhood] & MORRIS, N. [M.D., B.Sc., D.P.H., F.R.F.P.S.Glas., Lecturer in Biochemistry, University of Glasgow]. (1933). **Acidosis and Alkalosis.** pp. xii+203. 23 figs., 27 tables. [80 refs.] Edinburgh : E. & S. Livingstone. [8vo.] [7s. 6d.]

This short book can be confidently recommended to all concerned in obtaining a clear picture of the mechanisms controlling the acid-base equilibrium of the body in health and disease. The authors have tried to " steer between the Scylla of simple formulae and the Charybdis of higher mathematics," and to present a general survey without assuming special knowledge of recent advances in chemical physiology. They have succeeded.

Although written from the medical standpoint the principles are physiological and, therefore, equally applicable to veterinary medicine. In the general medical and veterinary literature the terms acidosis and alkalosis are frequently used as if they referred to disease entities, associated with clinical manifestations such as changes in urinary excretion and in respiratory behaviour. In reality the terms denote physico-chemical changes which may be manifestations of reaction to pathological processes, and physiological conditions which may even act as pathogenic agents, but which must be regarded from the purely symptomatic point of view until the mode of their production is understood. The conditions form part of the adaptation of the body to disease but are not themselves diseases—any more than fever, as such, is a disease. A clear understanding of the underlying processes involved in maintaining the neutrality of the tissues is therefore essential to the clinician, medical and veterinary alike. This the book provides.

—H. H. GREEN.